Tennessee Valley Authority, Post Office Box 2000 Spring City, Tennessee 37381

April 22, 2016

10 CFR 50.4
10 CFR 50.71(e)

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Watts Bar Nuclear Plant, Unit 1
Facility Operating License No. NPF-90
NRC Docket No. 50-390

Subject: **WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 – PERIODIC SUBMISSION FOR CHANGES MADE TO THE WBN TECHNICAL SPECIFICATION BASES AND TECHNICAL REQUIREMENTS MANUAL**

References: Tennessee Valley Authority (TVA) letter to the Nuclear Regulatory Commission (NRC) "Changes Made to the Technical Specifications Bases and Technical Requirements Manual," dated November 3, 2014 (ML14037A981)

The purpose of this letter is to provide the Nuclear Regulatory Commission (NRC) with copies of changes to the Watts Bar Nuclear Plant (WBN) Technical Specification (TS) Bases, through Revision 126, and WBN Technical Requirements Manual (TRM), through Revision 59, in accordance with WBN TS Section 5.6, "TS Bases Control Program," and WBN TRM Section 5.1, "Technical Requirements Control Program," respectively. These changes have been implemented at WBN during the period since WBN's last update (November 3, 2014) and meet the criteria described within the above control programs for which prior NRC approval is not required. Both control programs require such changes to be provided to the NRC on a frequency consistent with 10 CFR 50.71(e). Per the provisions of 10 CFR 50.71(e), the Updated Final Safety Analysis Report will be provided in a separate letter. The WBN TS Bases and TRM updates for the table of contents and change pages are provided in the enclosures.

There are no new regulatory commitments in this letter. If you have questions regarding this letter, please call Gordon Arent, Director of Watts Bar Site Licensing, at (423) 365-2004.

I certify the information provided accurately presents changes made since the last TS Bases and TRM update was submitted on November 3, 2014.

Respectfully,

Paul Simmons
Site Vice President
Watts Bar Nuclear Plant

Enclosures:

1 - WBN Technical Specification Bases - Table of Contents
2 - WBN Technical Specifications Bases - Changed Pages
3 - WBN Technical Requirements Manual - Table of Contents
4 - WBN Technical Requirements Manual - Changed Pages

cc (Enclosures):

NRC Regional Administrator - Region II
NRC Senior Resident Inspector - Watts Bar Nuclear Plant, Units 1 and 2
NRR Project Manager - Watts Bar Nuclear Plant, Units 1 and 2

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Acronym	Title
ABGTS	Auxiliary Building Gas Treatment System
ACRP	Auxiliary Control Room Panel
ASME	American Society of Mechanical Engineers
AFD	Axial Flux Difference
AFW	Auxiliary Feedwater System
ARO	All Rods Out
ARFS	Air Return Fan System
ADV	Atmospheric Dump Valve
BOC	Beginning of Cycle
CAOC	Constant Axial Offset Control
CCS	Component Cooling System
CFR	Code of Federal Regulations
COLR	Core Operating Limits Report
CREVS	Control Room Emergency Ventilation System
CSS	Containment Spray System
CST	Condensate Storage Tank
DNB	Departure from Nucleate Boiling
ECCS	Emergency Core Cooling System
EFPD	Effective Full-Power Days
EGTS	Emergency Gas Treatment System
EOC	End of Cycle
ERCW	Essential Raw Cooling Water
ESF	Engineered Safety Feature
ESFAS	Engineered Safety Features Actuation System
HEPA	High Efficiency Particulate Air
HVAC	Heating, Ventilating, and Air-Conditioning
LCO	Limiting Condition For Operation
MFIV	Main Feedwater Isolation Valve
MFRV	Main Feedwater Regulation Valve
MSIV	Main Steam Line Isolation Valve
MSSV	Main Steam Safety Valve
MTC	Moderator Temperature Coefficient
NMS	Neutron Monitoring System
ODCM	Offsite Dose Calculation Manual
PCP	Process Control Program
PDMS	Power Distribution Monitoring System
PIV	Pressure Isolation Valve
PORV	Power-Operated Relief Valve
PTLR	Pressure and Temperature Limits Report
QPTR	Quadrant Power Tilt Ratio
RAOC	Relaxed Axial Offset Control
RCCA	Rod Cluster Control Assembly
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RTP	Rated Thermal Power

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Acronym	Title
RTS	Reactor Trip System
RWST	Refueling Water Storage Tank
SG	Steam Generator
SI	Safety Injection
SL	Safety Limit
SR	Surveillance Requirement
UHS	Ultimate Heat Sink

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B 3.9-33	86		
B 3.9-34	0		
B 3.9-35	119		
B 3.9-36	119		

TECHNICAL SPECIFICATION BASES - REVISION LISTING

(This listing is an administrative tool maintained by WBN Licensing and may be updated without formally revising the Technical Specification Bases Table-of-Contents)

REVISIONS	ISSUED	SUBJECT
NPF-20	11-09-95	Low Power Operating License
Revision 1	12-08-95	Slave Relay Testing
NPF-90	02-07-96	Full Power Operating License
Revision 2 (Amendment 1)	12-08-95	Turbine Driven AFW Pump Suction Requirement
Revision 3	03-27-96	Remove Cold Leg Accumulator Alarm Setpoints
Revision 4 (Amendment 2)	06-13-96	Ice Bed Surveillance Frequency And Weight
Revision 5	07-03-96	Containment Airlock Door Indication
Revision 6 (Amendment 3)	09-09-96	Ice Condenser Lower Inlet Door Surveillance
Revision 7	09-28-96	Clarification of COT Frequency for COMS
Revision 8	11-21-96	Admin Control of Containment Isol. Valves
Revision 9	04-29-97	Switch Controls For Manual CI-Phase A
Revision 10 (Amendment 5)	05-27-97	Appendix-J, Option B
Revision 11 (Amendment 6)	07-28-97	Spent Fuel Pool Rerack
Revision 12	09-10-97	Heat Trace for Radiation Monitors
Revision 13 (Amendment 7)	09-11-97	Cycle 2 Core Reload
Revision 14	10-10-97	Hot Leg Recirculation Timeframe
Revision 15	02-12-98	EGTS Logic Testing
Revision 16 (Amendment 10)	06-09-98	Hydrogen Mitigation System Temporary Specification
Revision 17	07-31-98	SR Detectors (Visual/audible indication)
Revision 18 (Amendment 11)	09-09-98	Relocation of F(Q) Penalty to COLR
Revision 19 (Amendment 12)	10-19-98	Online Testing of the Diesel Batteries and Performance of the 24 Hour Diesel Endurance Run

TECHNICAL SPECIFICATION BASES - REVISION LISTING

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REVISIONS	ISSUED	SUBJECT
Revision 20 (Amendment 13)	10-26-98	Clarification of Surveillance Testing Requirements for TDAFW Pump
Revision 21	11-30-98	Clarification to Ice Condenser Door ACTIONS and door lift tests, and Ice Bed sampling and flow blockage SRs
Revision 22 (Amendment 14)	11-10-98	COMS - Four Hour Allowance to Make RHR Suction Relief Valve Operable
Revision 23	01-05-99	RHR Pump Alignment for Refueling Operations
Revision 24 (Amendment 16)	12-17-98	New action for Steam Generator ADVs due to Inoperable ACAS.
Revision 25	02-08-99	Delete Reference to PORV Testing Not Performed in Lower Modes
Revision 26 (Amendment 17)	12-30-98	Slave Relay Surveillance Frequency Extension to 18 Months
Revision 27 (Amendment 18)	01-15-99	Deletion of Power Range Neutron Flux High Negative Rate Reactor Trip Function
Revision 28	04-02-99	P2500 replacement with Integrated Computer System (ICS). Delete Reference to ERFDS as a redundant input signal.
Revision 29	03-13-00	Added notes to address instrument error in various parameters shown in the Bases. Also corrected the applicable modes for TS 3.6.5 from 3 and 4 to 2, 3 and 4.
Revision 30 (Amendment 23)	03-22-00	For SR 3.3.2.10, Table 3.3.2-1, one time relief from turbine trip response time testing. Also added Reference 14 to the Bases for LCO 3.3.2.
Revision 31 (Amendment 19)	03-07-00	Reset Power Range High Flux Reactor Trip Setpoints for Multiple Inoperable MSSVs.
Revision 32	04-13-00	Clarification to Reflect Core Reactivity and MTC Behavior.

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REVISIONS	ISSUED	SUBJECT
Revision 33	05-02-00	Clarification identifying four distribution boards primarily used for operational convenience.
Revision 34 (Amendment 24)	07-07-00	Elimination of Response Time Testing
Revision 35	08-14-00	Clarification of ABGTS Surveillance Testing
Revision 36 (Amendments 22 and 25)	08-23-00	Revision of Ice Condenser sampling and flow channel surveillance requirements
Revision 37 (Amendment 26)	09-08-00	Administrative Controls for Open Penetrations During Refueling Operations
Revision 38	09-17-00	SR 3.2.1.2 was revised to reflect the area of the core that will be flux mapped.
Revision 39 (Amendments 21and 28)	09-13-00	Amendment 21 - Implementation of Best Estimate LOCA analysis. Amendment 28 - Revision of LCO 3.1.10, "Physics Tests Exceptions - Mode 2."
Revision 40	09-28-00	Clarifies WBN's compliance with ANSI/ANS-19.6.1 and deletes the detailed descriptions of Physics Tests.
Revision 41 (Amendment 31)	01-22-01	Power Uprate from 3411 MWt to 3459 MWt Using Leading Edge Flow Meter (LEFM)
Revision 42	03-07-01	Clarify Operability Requirements for Pressurizer PORVs
Revision 43	05-29-01	Change CVI Response Time from 5 to 6 Seconds
Revision 44 (Amendment 33)	01-31-02	Ice weight reduction from 1236 to 1110 lbs per basket and peak containment pressure revision from 11.21 to 10.46 psig.
Revision 45 (Amendment 35)	02-12-02	Relaxation of CORE ALTERATIONS Restrictions
Revision 46	02-25-02	Clarify Equivalent Isolation Requirements in LCO 3.9.4

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REVISIONS	ISSUED	SUBJECT
Revision 47 (Amendment 38)	03-01-02	RCS operational LEAKAGE and SG Alternate Repair Criteria for Axial Outside Diameter Stress Corrosion Cracking (ODSCC)
Revision 48 (Amendment 36)	03-06-02	Increase Degraded Voltage Time Delay from 6 to 10 seconds.
Revision 49 (Amendment 34)	03-08-02	Deletion of the Post-Accident Sampling System (PASS) requirements from Section 5.7.2.6 of the Technical Specifications.
Revision 50 (Amendment 39)	08-30-02	Extension of the allowed outage time (AOT) for a single diesel generator from 72 hours to 14 days.
Revision 51	11-14-02	Clarify that Shutdown Banks C and D have only One Rod Group
Revision 52 (Amendment 41)	12-20-02	RCS Specific Activity Level reduction from <1.0 μCi/gm to <0.265 μCi/gm.
Revision 53 (Amendment 42)	01-24-03	Revise SR 3.0.3 for Missed Surveillances
Revision 54 (Amendment 43)	05-01-03	Exigent TS SR 3.5.2.3 to delete SI Hot Leg Injection lines from SR until U1C5 outage.
Revision 55	05-22-03	Editorial corrections (PER 02-015499), correct peak containment pressure, and revise I-131 gap inventory for an FHA.
Revision 56	07-10-03	TS Bases for SRs 3.8.4.8 through SR 3.8.4.10 clarification of inter-tier connection resistance test.
Revision 57	08-11-03	TS Bases for B 3.5.2 Background information provides clarification when the 9 hrs for hot leg recirculation is initiated.
Revision 58 (Amendment 45)	09-26-03	The Bases for LCO 3.8.7 and 3.8.8 were revised to delete the Unit 2 Inverters.
Revision 59 (Amendment 46)	09-30-03	Address new DNB Correlation in B2.1.1 and B3.2.12 for Robust Fuel Assembly (RFA)-2.
Revision 60 (Amendment 47)	10-06-03	RCS Flow Measurement Using Elbow Tap Flow Meters (Revise Table 3.3.1-1(10) & SR 3.4.1.4).

TECHNICAL SPECIFICATION BASES - REVISION LISTING

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REVISIONS	ISSUED	SUBJECT
Revision 61 (Amendments 40 and 48)	10-14-03	Incorporated changes required to implement the Tritium Program (Amendment 40) and Stepped Boron Concentration increases for RWST and CLAs (Amendment 48) depending on the number of TPBARS installed into the reactor core.
Revision 62	10-15-03	Clarified ECCS venting in Bases Section B 3.5.2 (WBN-TS-03-19)
Revision 63	12-08-03	The contingency actions listed in Bases Table 3.8.1-2 were reworded to be consistent with the NRC Safety Evaluation that approved Tech Spec Amendment 39.
Revision 64 (Amendment 50)	03-23-04	Incorporated Amendment 50 for the seismic qualification of the Main Control Room duct work. Amendment 50 revised the Bases for LCO 3.7.10, "CREVS," and LCO 3.7.11, "CREATCS." An editorial correction was made on Page B 3.7-61.
Revision 65	04-01-04	Revised the Bases for Action B.3.1 of LCO 3.8.1 to clarify that a common cause assessment is not required when a diesel generator is made inoperable due to the performance of a surveillance.
Revision 66	05-21-04	Revised Page B 3.8-64 (Bases for LCO 3.8.4) to add a reference to SR 3.8.4.13 that was inadvertently deleted by the changes made for Amendment 12.
Revision 67 (Amendment 45)	03-05-05	Revised the Bases for LCOs 3.8.7, 3.8.8 and 3.8.9 to incorporate changes to the Vital Inverters (DCN 51370). Refer to the changes made for Bases Revision 58 (Amendment 45)
Revision 68 (Amendment 55)	03-22-05	Amendment 55 modified the requirements for mode change limitations in LCO 3.0.4 and SR 3.0.4 by incorporating TSTF-359, Revision 9.

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REVISIONS	ISSUED	SUBJECT
Revision 68 (Amendment 55 and 56)	03-22-05	Change MSLB primary to secondary leakage from 1 gpm to 3 gpm (WBN-TS-03-14).
Revision 69 (Amendment 54)	04-04-05	Revised the use of the terms inter-tier and inter-rack in the Bases for SR 3.8.4.10.
Revision 70 (Amendment 58)	10-17-05	Alternate monitoring process for a failed Rod Position Indicator (RPI) (TS-03-12).
Revision 71 (Amendment 59)	02-01-06	Temporary Use of Penetrations in Shield Building Dome During Modes 1-4 (WBN-TS-04-17)
Revision 72	08-31-06	Minor Revision (Corrects Typographical Error) – Changed LCO Bases Section 3.4.6 which incorrectly referred to Surveillance Requirement 3.4.6.2 rather than correctly identifying Surveillance Requirement 3.4.6.3.
Revision 73	09-11-06	Updated the Bases for LCO 3.9.4 to clarify that penetration flow paths through containment to the outside atmosphere must be limited to less than the ABSCE breach allowance. Also administratively removed from the Bases for LCO 3.9.4 a statement on core alterations that should have been removed as part of Amendment 35.
Revision 74	09-16-06	For the LCO section of the Bases for LCO 3.9.4, administratively removed the change made by Revision 73 to the discussion of an LCO note and placed the change in another area of the LCO section.
Revision 75 (Amendment 45)	09-18-06	Revised the Bases for LCOs 3.8.7, 3.8.8 and 3.8.9 to incorporate a spare inverter for Channel 1-II of the Vital Inverters (DCN 51370).

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REVISIONS	ISSUED	SUBJECT
Revision 76 (Amendment 45)	09-22-06	Revised the Bases for LCOs 3.8.7, 3.8.8 and 3.8.9 to incorporate a spare inverter for Channel 1-IV of the Vital Inverters (DCN 51370).
Revision 77 (Amendment 45)	10-10-06	Revised the Bases for LCOs 3.8.7, 3.8.8 and 3.8.9 to incorporate a spare inverter for Channel 1-I of the Vital Inverters (DCN 51370).
Revision 78 (Amendment 45)	10-13-06	Revised the Bases for LCOs 3.8.7, 3.8.8 and 3.8.9 to incorporate a spare inverter for each of the Vital Inverters (DCN 51370).
Revision 79 (Amendment 60, 61 and 64)	11-03-06	Steam Generator Narrow Range Level Indication Increased from 6% to 32% (WBN-TS-05-06) Bases Sections 3.4.5, 3.4.6, and 3.4.7.
Revision 80	11-08-06	Revised the Bases for SR 3.5.2.8 to clarify that inspection of the containment sump strainer constitutes inspection of the trash rack and the screen functions.
Revision 81 (Amendment 62)	11-15-06	Revised the Bases for SR 3.6.11.2, 3.6.11.3, and 3.6.11.4 to address the Increase Ice Weight in Ice Condenser to Support Replacement Steam Generators (WBN-TS-05-09) [SGRP]
Revision 82 (Amendment 65)	11-17-06	Steam Generator (SG) Tube Integrity (WBN-TS-05-10) [SGRP]
Revision 83	11-20-06	Updated Surveillance Requirement (SR) 3.6.6.5 to clarify that the number of unobstructed spray nozzles is defined in the design bases.
Revision 84	11-30-06	Revised Bases 3.6.9 and 3.6.15 to show the operation of the EGTS when annulus pressure is not within limits.
Revision 85	03-22-07	Revised Bases 3.6.9 and 3.6.15 in accordance with TACF 1-07-0002-065 to clarify the operation of the EGTS.

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REVISIONS	ISSUED	SUBJECT
Revision 86	01-31-08	Figure 3.7.15-1 was deleted as part of Amendment 40. A reference to the figure in the Bases for LCO 3.9.9 was not deleted at the time Amendment 40 was incorporated into the Technical Specifications. Bases Revision 86 corrected this error (refer to PER 130944).
Revision 87	02-12-08	Implemented Bases change package TS-07-13 for DCN 52220-A. This DCN ties the ABI and CVI signals together so that either signal initiates the other signal.
Revision 88 (Amendment 67)	03-06-08	Technical Specification Amendment 67 increased the number of TPBARs from 240 to 400.
Revision 89 (Amendment 66)	05-01-08	Update of Bases to be consistent with the changes made to Section 5.7.2.11 of the Technical Specifications to reference the ASME Operation and Maintenance Code
Revision 90 (Amendment 68)	10-02-08	Issuance of amendment regarding Reactor Trip System and Engineered Safety Features Actuation System completion times, bypass test times, and surveillance test intervals
Revision 91 (Amendment 70)	11-25-2008	The Bases for TS 3.7.10, "Control Room Emergency Ventilation System (CREVS)" were revised to address control room envelope habitability.
Revision 92 (Amendment 71)	11-26-2008	The Bases for TS 3.4.15, "RCS Leakage Detection Instrumentation" were revised to remove the requirement for the atmospheric gaseous radiation monitor as one of the means for detecting a one gpm leak within one hour.
Revision 93 (Amendment 74)	02-09-2009	Updates the discussion of the Allowable Values associated with the Containment Purge Radiation Monitors in the LCO section of the Bases for LCO 3.3.6.
Revision 94 (Amendment 72)	02-23-2009	Bases Revision 94 [Technical Specification (TS)] Amendment 72 deleted the Hydrogen Recombiners (LCO 3.6.7) from the TS and moved the requirements to the Technical Requirements Manual.

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REVISIONS	ISSUED	SUBJECT
Revision 95	03-05-2009	Corrected an error in SR 3.3.2.6 which referenced Function 6.g of TS Table 3.3.2-1. This function was deleted from the TS by Amendment 1.
Revision 96 (Amendment 75)	06-19-2009	Modified Mode 1 and 2 applicability for Function 6.e of TS Table 3.3.2-1, "Engineered Safety Feature Actuation System Instrumentation." This is associated with AFW automatic start on trip of all main feedwater pumps. In addition, revised LCO 3.3.2, Condition J, to be consistent with WBN Unit 1 design bases.
Revision 97 (Amendment 76)	09-23-2009	Amendment 76 updates LCO 3.8.7, "Inverters - Operating" to reflect the installation of the Unit 2 inverters.
Revision 98 (Amendments 77, 79, & 81)	10-05-2009	Amendment 77 revised the number of TPBARs that may be loaded in the core from 400 to 704. Amendment 79 revised LCO 3.6.3 to allow verification by administrative means isolation devices that are locked, sealed, or otherwise secured. Amendment 81 revised the allowed outage time of Action B of LCO 3.5.1 from 1 hour to 24 hours.
Revision 99	10-09-2009	Bases Revision 99 incorporated Westinghouse Technical Bulletin (TB) 08-04.
Revision 100	11-17-2009	Bases Revision 100 revises the LCO description of the Containment Spray System to clarify that transfer to the containment sump is accomplished by manual actions.
Revision 101	02-09-2010	Bases Revision 101 implemented DCN 52216-A that will place both trains of the EGTS pressure control valve's hand switches in A-AUTO and will result in the valves opening upon initiation of the Containment Isolation phase A (CIA) signal. They will remain open independent of the annulus pressure and reset of the CIA.
Revision 102	03-01-2010	Bases Revision 102 implemented EDC 52564-A which addresses a new single failure scenario relative to operation of the EGTS post LOCA.

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REVISIONS	ISSUED	SUBJECT
Revision 103	04-05-2010	Bases Revision 103 implemented NRC guidance "Application of Generic Letter 80-30" which allows a departure from the single failure criterion where a non-TS support system has two 100% capacity subsystems, each capable of supporting the design heat load of the area containing the TS equipment.
Revision 104 (Amendment 82)	09-20-2010	Bases Revision 104 implemented License Amendment No. 82, which approved the BEACON-TSM application of the Power Distributing System. The PDMS requirements reside in the TRM.
Revision 105	10-28-2010	DCN 53437 added spare chargers 8-S and 9-S which increased the total of 125 VDC Vital Battery Chargers to eight (8).
Revision 106	01-20-2011	Revised SR 3.8.3.6 to clarify that identified fuel oil leakage does not constitute failure of the surveillance.
Revision 107 (Amendment 85)	02-24-2011	Amendment 85 revises TS 3.7.11, "Control Room Emergency Air Temperature Control System (CREATCS). Specifically, the proposed change will only be applicable during plant modifications to upgrade the CREATCS chillers. This "one-time" TS change will be implemented during Watts Bar Nuclear Plant, Unit 1 Cycles 10 and 11 beginning March 1, 2011, and ending April 30, 2012.
Revision 108	03-07-2011	Bases Revision 108 deletes reference to NSRB to be notified of violation of a safety limit within 24 hours in TSB 2.2.4. Also, corrected error in SR 3.3.2.4 in the reference to Table 3.3.1-1. It should be Table 3.3.2-1.
Revision 109	04-06-2011	Bases Revision 109 clarifies that during plant startup in Mode 2 the AFW anticipatory auto-start signal need not be OPERABLE if the AFW system is in service. PER 287712 was identified by NRC to provide clarification to TS Bases 3.3.2, Function 6.e, Trip of All Turbine Driven Main Feedwater Pumps.
Revision 110	04-19-2011	Clarified the text associated with the interconnection of the ABI and CVI functions in the bases for LCO 3.3.6, 3.3.8, 3.7.12 and 3.9.8.

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REVISIONS	ISSUED	SUBJECT
Revision 111	05-05-2011	Added text to several sections of the Bases for LCO 3.4.16 to clarify that the actual transient limit for I-131 is 14 μCi/gm and refers to the controls being placed in AOI-28.
Revision 112	05-24-2011	DCN 55076 replaces the existing four 125-Vdc DG Battery Chargers with four sets of redundant new battery charger assemblies.
Revision 113	06-24-2011	Final stage implementation of DCN 55076 which replaced the existing four 125-Vdc DG Battery Chargers with four sets of redundant new battery charger assemblies.
Revision 114	12-12-2011	Clarifies the acceptability of periodically using a portion of the 25% grace period in SR 3.0.2 to facilitate 13 week maintenance work schedules.
Revision 115	12-21-2011	Revises several surveillance requirements notes in TS 3.8.1 to allow performance of surveillances on WBN Unit 2 6.9 kV shutdown boards and associated diesel generators while WBN Unit 1 is operating in MODES 1, 2, 3, or 4
Revision 116	06-27-2012	Revises TS Bases 3.8.1, AC Sources - Operating, to make the TS Bases consistent with TS 3.8.1, Condition D
Revision 117	07-27-2012	Revises TS Bases 3.7.10, Control Room Emergency Ventilation System (CREVS), to make the TS Bases consistent with TS 3.7.10, Condition E
Revision 118	01-30-2013	Revises TS Bases 3.4.16, Reactor Coolant System (RCS) to change the dose equivalent I-131 spike limit and the allowable value for control room air intake radiation monitors.
Revision 119	08-17-2013	Revises TS Bases 3.3.6, 3.3.8, 3.7.12, 3.7.13, 3.9.4, 3.9.7, 3.9.8, and adds TS Bases 3.9.10 to reflect selective implementation of the Alternate Source Term methodology for the analysis of Fuel Handling Accidents (FHAs) and make TS Bases consistent with the revised FHA dose analysis.
Revision 120	01-23-2014	Revised the References to TS Bases 3.1.9, PHYSICS TESTS Exceptions - Mode1, to document NRC approval of WCAP 12472-P-A. Addendum 1-A and 4-A., Addendum 1-A approved the use of the Advance Nodal Code (ANC-Phoenix_ in the BEACON

		system as the neutronic code for measuring core power distribution. Is also approved the use of fixed incore self-powered neutron detectors (SPD_ to calibrate the BEACON system in lieu of incore and excore neutron detectors and core exit thermocouples (CET). For plants that do not have SPDs Addendum 4-A approved Westinghouse methodology that allow the BEACON system to calculate CET uncertainty as a function of reactor power on a plant cycle basis during power ascension following a refueling outage.
Revision 121	08-04-2014	Revises references in TS Bases 3.7.1 for consistency with changes to the TS Bases 3.7.1 references approved in Revision 89.
Revision 122 (Amendment 94)	01-14-2014	Revises TS Bases 3.7.10, Control Room Emergency Ventilation System (CREVS) to make the TS Bases consistent with TS 3.7.10, Actions E, F, G, and H.
Revision 123 (Amendment 104)	03-17-2016	Amendment 104, TSB Revision 123 adds TS B3.7.16, "Component Cooling System (CCS) - Shutdown" and adds TS B3.7.17, "Essential Raw Cooling Water (ERCW) System - Shutdown.
Revision 124	02-12-2016	Revises TS Bases Table B3.8.9-1, "AC and DC Electrical Power Distribution Systems," the second Note.
Revision 125 (Amendment 84, 102, 103)	03-17-2016	Revises TS Bases Section B3.8-1, "AC Sources-Operating."
Revision 126	03-17-2016	Revises TS Bases Section B3.7.7, "Component Cooling System" the 1B and 2B surge tank sections.

ENCLOSURE 2
WBN TECHNICAL SPECIFICATION BASES
CHANGED PAGES

BASES

ACTIONS (continued)

When the number of inoperable channels in a trip function exceed those specified in one or other related Conditions associated with a trip function, then the unit is outside the safety analysis. Therefore, LCO 3.0.3 should be immediately entered if applicable in the current MODE of operation.

A.1

Condition A applies to all ESFAS protection functions.

Condition A addresses the situation where one or more channels or trains for one or more Functions are inoperable at the same time. The Required Action is to refer to Table 3.3.2-1 and to take the Required Actions for the protection functions affected. The Completion Times are those from the referenced Conditions and Required Actions.

B.1, B.2.1 and B.2.2

Condition B applies to manual initiation of:

- SI;
- Containment Spray;
- Phase A Isolation; and
- Phase B Isolation.

Condition B also applies to the Auxiliary Feedwater Pump Suction Transfer on Suction Pressure - Low.

For the manual initiation Functions, this action addresses the train orientation of the SSPS for the functions listed above. For the AFW System pump suction transfer channels, this action recognizes that placing a failed channel in trip during operation is not necessarily a conservative action. Spurious trip of this function could align the AFW System to a source that is not immediately capable of supporting pump suction. If a channel or train is inoperable, 48 hours is allowed to return it to an OPERABLE status. Note that for containment spray and Phase B isolation, failure of one or both channels in one train renders the train inoperable. Condition B, therefore, encompasses both situations.

(continued)

ACTIONS

B.1, B.2.1 and B.2.2 (continued)

For the manual initiation Functions, the specified Completion Time is reasonable considering that there are two automatic actuation trains and another manual initiation train OPERABLE for each Function, and the low probability of an event occurring during this interval. For the AFW System pump suction transfer channels, the specified Completion Time is reasonable considering the nature of this Function, the available redundancy, and the low probability of an event occurring during this interval. If the channel or train cannot be restored to OPERABLE status, the plant must be placed in a MODE in which the LCO does not apply. This is done by placing the plant in at least MODE 3 within an additional 6 hours (54 hours total time) and in MODE 5 within an additional 30 hours (84 hours total time). The allowable Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems. For the AFW System pump suction transfer channels, aligning the RHR System for decay heat removal, so that the steam generators are not relied on for heat removal, places the plant in a MODE in which the LCO no longer applies. Therefore, per LCO 3.0.2, completion of the Required Action to place the unit in MODE 5 is not required.

For the manual initiation Functions, the allowance of 48 hours is justified in Reference 7.

C.1, C.2.1 and C.2.2

Condition C applies to the automatic actuation logic and actuation relays for the following functions:

- SI;
- Containment Spray;
- Phase A Isolation;
- Phase B Isolation; and
- Automatic Switchover to Containment Sump.

This action addresses the train orientation of the SSPS and the master and slave relays. If one train is inoperable, 24 hours are allowed to restore the train to OPERABLE status. The 24 hours allowed for restoring the inoperable train to OPERABLE status are justified in Reference 17. The specified Completion Time is reasonable considering that there is another train OPERABLE, and the low probability of an event occurring during this interval. If the train cannot be restored to OPERABLE status, the plant must be placed in a MODE in which the

(continued)

BASES

ACTIONS

C.1, C.2.1 and C.2.2 (continued)

LCO does not apply. This is done by placing the plant in at least MODE 3 within an additional 6 hours (30 hours total time) and in MODE 5 within an additional 30 hours (60 hours total time). The Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

The Required Actions are modified by a Note that allows one train to be bypassed for up to 4 hours for surveillance testing, provided the other train is OPERABLE. This allowance is based on the reliability analysis assumption of WCAP-10271-P-A (Ref. 7) that 4 hours is the average time required to perform train surveillance.

D.1, D.2.1, and D.2.2

Condition D applies to:

- Containment Pressure-High;
- Pressurizer Pressure-Low;
- Steam Line Pressure-Low; and
- Steam Line Pressure-Negative Rate-High.

If one channel is inoperable, 72 hours are allowed to restore the channel to OPERABLE status or to place it in the tripped condition. Generally this Condition applies to functions that operate on two-out-of-three logic. Therefore, failure of one channel places the Function in a two-out-of-two configuration. One channel must be tripped to place the Function in a one-out-of-three configuration that satisfies redundancy requirements. The 72 hours allowed to restore the channel to OPERABLE status or to place it in the tripped condition are justified in Reference 17.

(continued)

BASES

ACTIONS

D.1, D.2.1, and D.2.2 (continued)

Failure to restore the inoperable channel to OPERABLE status or place it in the tripped condition within 72 hours requires the plant be placed in MODE 3 within the following 6 hours and MODE 4 within the next 6 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems. In MODE 4, these Functions are no longer required OPERABLE.

The Required Actions have been modified by a Note that allows placing an inoperable channel in the bypassed condition for up to 12 hours while performing routine surveillance testing of other channels. The Note also allows a channel to be placed in bypass for up to 12 hours for testing of the bypassed channel. However, only one channel may be placed in bypass at any one time. The 12 hours allowed for testing are justified in Reference 17.

E.1, E.2.1, and E.2.2

Condition E applies to:

- Containment Spray Containment Pressure-High High;
- Steam Line Isolation Containment Pressure-High High; and
- Containment Phase B Isolation Containment Pressure-High High.

None of these signals has input to a control function. Thus, two-out-of-three logic is necessary to meet acceptable protective requirements. However, a two-out-of-three design would require tripping a failed channel. This is undesirable because a single failure would then cause spurious containment spray initiation. Spurious spray actuation is undesirable because of the cleanup problems presented. Therefore, these channels are designed with

(continued)

BASES

ACTIONS

E.1, E.2.1, and E.2.2 (continued)

two-out-of-four logic so that a failed channel may be bypassed rather than tripped. Note that one channel may be bypassed and still satisfy the single failure criterion. Furthermore, with one channel bypassed, a single instrumentation channel failure will not spuriously initiate containment spray.

To avoid the inadvertent actuation of containment spray and Phase B containment isolation, the inoperable channel should not be placed in the tripped condition. Instead it is bypassed. Restoring the channel to OPERABLE status, or placing the inoperable channel in the bypass condition within 72 hours, is sufficient to assure that the Function remains OPERABLE and minimizes the time that the Function may be in a partial trip condition (assuming the inoperable channel has failed high). The Completion Time is further justified based on the low probability of an event occurring during this interval. Failure to restore the inoperable channel to OPERABLE status, or place it in the bypassed condition within 72 hours, requires the plant be placed in MODE 3 within the following 6 hours and MODE 4 within the next 6 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems. In MODE 4, these Functions are no longer required OPERABLE.

The Required Actions are modified by a Note that allows placing one channel in bypass for up to 12 hours while performing routine surveillance testing. The channel to be tested can be tested in bypass with the inoperable channel also in bypass. The time limit is justified in Reference 17.

F.1, F.2.1, and F.2.2

Condition F applies to:

- Manual Initiation of Steam Line Isolation;

  Loss of Offsite Power;

  and

- P-4 Interlock.

(continued)

ACTIONS

F.1, F.2.1, and F.2.2 (continued)

For the Manual Initiation and the P-4 Interlock Functions, this action addresses the train orientation of the SSPS. For the Loss of Offsite Power Function, this action recognizes the lack of manual trip provision for a failed channel. If a train or channel is inoperable, 48 hours is allowed to return it to OPERABLE status. The specified Completion Time is reasonable considering the nature of these Functions, the available redundancy, and the low probability of an event occurring during this interval. If the Function cannot be returned to OPERABLE status, the plant must be placed in MODE 3 within the next 6 hours and MODE 4 within the following 6 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power in an orderly manner and without challenging plant systems. In MODE 4, the plant does not have any analyzed transients or conditions that require the explicit use of the protection functions noted above.

G.1, G.2.1 and G.2.2

Condition G applies to the automatic actuation logic and actuation relays for the Steam Line Isolation and AFW actuation Functions.

The action addresses the train orientation of the SSPS and the master and slave relays for these functions. If one train is inoperable, 24 hours are allowed to restore the train to OPERABLE status. The 24 hours allowed for restoring the channel to OPERABLE status or to place it in the tripped condition are justified in Reference 17. The Completion Time for restoring a train to OPERABLE status is reasonable considering that there is another train OPERABLE, and the low probability of an event occurring during this interval. If the train cannot be returned to OPERABLE status, the plant must be brought to MODE 3 within the next 6 hours and MODE 4 within the following 6 hours. The allowed Completion Times are reasonable, based on operating experience, to

(continued)

BASES

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.6 RCS Loops - MODE 4

BASES

BACKGROUND

In MODE 4, the primary function of the reactor coolant is the removal of decay heat and the transfer of this heat to either the steam generator (SG) secondary side coolant or the component cooling water via the residual heat removal (RHR) heat exchangers. The secondary function of the reactor coolant is to act as a carrier for soluble neutron poison, boric acid.

The reactor coolant is circulated through four RCS loops connected in parallel to the reactor vessel, each loop containing an SG, a reactor coolant pump (RCP), and appropriate flow, pressure, level, and temperature instrumentation for control, protection, and indication. The RCPs circulate the coolant through the reactor vessel and SGs at a sufficient rate to ensure proper heat transfer and to prevent boric acid stratification.

In MODE 4, with the reactor trip breakers open and the rods not capable of withdrawal, either RCPs or RHR loops can be used to provide forced circulation. The intent in this case is to provide forced flow from at least one RCP or one RHR loop for decay heat removal and transport. The flow provided by one RCP loop or RHR loop is adequate for decay heat removal. The other intent is to require that two paths be available to provide redundancy for decay heat removal.

In MODE 4, with the reactor trip breakers closed and the rods capable of withdrawal, two RCPs must be OPERABLE and in operation to provide forced circulation.

During a normal shutdown, decay heat removal is via the RCS loops until sometime after the unit has been cooled down to RHR entry conditions (T_{cold} < 350°F). Therefore, as LCO 3.4.6 becomes Applicable (entry into MODE 4) the RCS loops are still OPERABLE. Transitioning decay heat removal to the RHR System will place high heat loads on the RHR System, Component Cooling System (CCS), and the Essential Raw Cooling Water System (ERCW). Residual and decay heat from the RCS is transferred to CCS via the RHR HX. Heat from the CCS is transferred to the ERCW System via the CCS HXs. The CCS and ERCW systems are common between the two operating units.

APPLICABLE SAFETY ANALYSES

In MODE 4, with the reactor trip breakers open and the rods not capable of withdrawal, RCS circulation is considered in determination of the time available for mitigation of the accidental boron dilution event. The RCS and RHR loops provide this circulation.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

Whenever the reactor trip breakers (RTBs) are in the closed position and the control rod drive mechanisms (CRDMs) are energized, an inadvertent rod withdrawal from subcritical, resulting in a power excursion, is possible. Such a transient could be caused by a malfunction of the rod control system. In addition, the possibility of a power excursion due to the ejection of an inserted control rod is possible with the breakers closed or open. Such a transient could be caused by the mechanical failure of a CRDM.

Therefore, in MODE 4 with RTBs in the closed position and Rod Control System capable of rod withdrawal, accidental control rod withdrawal from subcritical is postulated and requires at least two RCS loops to be OPERABLE and in operation to ensure that the accident analyses limits are met. For those conditions when the Rod Control System is not capable of rod withdrawal, any combination of two RCS or RHR loops are required to be OPERABLE, but only one loop is required to be in operation to meet decay heat removal requirements, except during the initial seven hours after unit shutdown, when the decay and latent heat load may exceed the heat removal capability of one RHR loop in operation.

During the initial seven hours after reactor shutdown, the heat loads are at sufficiently high levels that the requirement of LCO 3.4.6 for one RHR loop in operation may not be sufficient to mitigate a design basis accident on Unit 2 and preclude a heatup of Unit 1.

To assure that there would be adequate heat removal capability under all postulated conditions during the initial seven hours after unit shutdown, reliance on heat removal via RCS loops is required. After a unit has been shutdown for greater than seven hours, a single RHR loop in operation provides adequate heat removal capability.

RCS Loops - MODE 4 have been identified in the NRC Policy Statement as important contributors to risk reduction.

LCO

The purpose of this LCO is to require that at least two loops be OPERABLE. In MODE 4 with the RTBs in the closed position and Rod Control System capable of rod withdrawal, two RCS loops must be OPERABLE and in operation. Two RCS loops are required to be in operation in MODE 4 with RTBs closed and Rod Control System capable of rod withdrawal due to the postulation of a power excursion because of an inadvertent control rod withdrawal. The required number of RCS loops in operation ensures that the Safety Limit criteria will be met for all of the postulated accidents.

With the RTBs in the open position, or the CRDMs de-energized, the Rod Control System is not capable of rod withdrawal; therefore, only one loop in operation is necessary to ensure removal of decay heat from the core and homogenous boron concentration throughout the RCS. In this case, the LCO allows the two loops that are required to be OPERABLE to consist of any combination of RCS loops

(continued)

BASES

LCO (continued)

and RHR loops. An additional loop is required to be OPERABLE to provide redundancy for heat removal.

Note 1 requires that the secondary side water temperature of each SG be less than or equal to 50°F above each of the RCS cold leg temperatures before the start of an RCP with any RCS cold leg temperature less than or equal to 350°F. This restraint is to prevent a low temperature overpressure event due to a thermal transient when an RCP is started.

Note 2 requires two RCS loops to be OPERABLE during the initial seven hours after entry into MODE 3 from MODE 1 or MODE 2 until decay heat and latent heat are within the capacity of the RHR System.

Note 3 precludes entry into MODE 5 during the initial seven hours after entry into MODE 3 from MODE 2 or MODE 1. This ensures that heat removal capability via RCS loops is retained until decay heat and latent heat are within the capacity of the RHR System.

An OPERABLE RCS loop comprises an OPERABLE RCP and an OPERABLE SG which has the minimum water level specified in SR 3.4.6.3.

Similarly for the RHR System, an OPERABLE RHR loop comprises an OPERABLE RHR pump capable of providing forced flow to an OPERABLE RHR heat exchanger. RCPs and RHR pumps are OPERABLE if they are capable of being powered and are able to provide forced flow if required.

APPLICABILITY

In MODE 4, this LCO ensures forced circulation of the reactor coolant to remove decay heat from the core and to provide proper boron mixing. One loop of either RCS or RHR provides sufficient circulation for these purposes. However, two loops consisting of any combination of RCS and RHR loops are required to be OPERABLE to meet single failure considerations.

Operation in other MODES is covered by:

LCO 3.4.4, "RCS Loops - MODES 1 and 2";
LCO 3.4.5, "RCS Loops - MODE 3";
LCO 3.4.7, "RCS Loops - MODE 5, Loops Filled";
LCO 3.4.8, "RCS Loops - MODE 5, Loops Not Filled";
LCO 3.9.5, "Residual Heat Removal (RHR) and Coolant Circulation - High Water Level" (MODE 6); and
LCO 3.9.6, "Residual Heat Removal (RHR) and Coolant Circulation - Low Water Level" (MODE 6).

(continued)

ACTIONS

A.1

If only one RCS loop is OPERABLE and both RHR loops are inoperable, redundancy for heat removal is lost, and action must be initiated to restore a second RCS or RHR loop to OPERABLE status. If only one RCS loop is OPERABLE and it has been less than seven hours since the unit has entered MODE 3 from MODE 1 or MODE 2, redundancy has been lost and action must be initiated to restore a second RCS loop to OPERABLE status. The immediate Completion Time reflects the importance of maintaining the availability of two paths for heat removal.

B.1

If one required RHR loop is OPERABLE and in operation and there are no RCS loops OPERABLE, an inoperable RCS or RHR loop must be restored to OPERABLE status to provide a redundant means for decay heat removal.

If the parameters that are outside the limits cannot be restored, the plant must be brought to MODE 5 within 24 hours. Bringing the plant to MODE 5 is a conservative action with regard to decay heat removal. With only one required RHR loop OPERABLE, redundancy for decay heat removal is lost and, in the event of a loss of the remaining RHR loop, it would be safer to initiate that loss from MODE 5 (less than or equal to 200°F) rather than MODE 4 (200 to 350°F). The Completion Time of 24 hours is a reasonable time, based on operating experience, to reach MODE 5 from MODE 4 in an orderly manner and without challenging plant systems.

C.1 and C.2

If one required RCS loop is not in operation, and the RTBs are closed and Rod Control System capable of rod withdrawal, the Required Action is either to restore the required RCS loop to operation or to de-energize all CRDMs by opening the RTBs or de-energizing the motor generator (MG) sets. When the RTBs are in the closed position and Rod Control System capable of rod withdrawal, it is postulated that a power excursion could occur in the event of an inadvertent control rod withdrawal. This mandates having the heat transfer capacity of two RCS loops in operation. If only one loop is in operation, the RTBs must be opened. The Completion Times of 1 hour to restore the required RCS loop to operation or de-energize all CRDMs is adequate to perform these operations in an orderly manner without exposing the unit to risk for an undue time period.

(continued)

ACTIONS (continued)

D.1, D.2 and D.3

If no loop is OPERABLE or in operation, all CRDMs must be de-energized by opening the RTBs or de-energizing the MG sets. All operations involving a reduction of RCS boron concentration must be suspended, and action to restore one required RCS or RHR loop to OPERABLE status and operation must be initiated. Boron dilution requires forced circulation for proper mixing, and the margin to criticality must not be reduced in this type of operation. Opening the RTBs or de-energizing the MG sets removes the possibility of an inadvertent rod withdrawal. The immediate Completion Times reflect the importance of maintaining operation for decay heat removal. The action to restore must be continued until one loop is restored to OPERABLE status and operation.

SURVEILLANCE REQUIREMENTS

SR 3.4.6.1

This SR requires verification every 12 hours that two RCS loops are in operation when the rod control system is capable of rod withdrawal. Verification includes flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal. The Frequency of 12 hours is sufficient considering other indications and alarms available to the operator in the control room to monitor RCS and RHR loop performance.

SR 3.4.6.2

This SR requires verification every 12 hours that one required RCS or RHR loop is in operation when the rod control system is not capable of rod withdrawal. Verification includes flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal. The Frequency of 12 hours is sufficient considering other indications and alarms available to the operator in the control room to monitor RCS and RHR loop performance.

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B 3.7 PLANT SYSTEMS

B 3.7.7 Component Cooling System (CCS)

BASES

BACKGROUND

The CCS provides a heat sink for the removal of process and operating heat from safety related components during a Design Basis Accident (DBA) or transient. During normal operation, the CCS also provides this function for various nonessential components, as well as the spent fuel storage pool. The CCS serves as a barrier to the release of radioactive byproducts between potentially radioactive systems and the Essential Raw Cooling Water (ERCW) System, and thus to the environment.

The CCS is arranged as two independent, full-capacity cooling trains, Train A and B. Train A in unit 1 is served by CCS Hx A and CCS pump 1A-A. Pump 1B-B, which is actually Train B equipment, is also normally aligned to the Train A header in unit 1. However, pump 1B-B can be realigned to Train B on loss of Train A.

Train B is served by CCS Hx C. Normally, only CCS pump C-S is aligned to the Train B header since few nonessential, normally-operating loads are assigned to Train B. However, pump 1B-B can be realigned to the Train B header on a loss of the C-S pump.

Each safety related train is powered from a separate bus. An open surge tank in the system provides pump trip protective functions to ensure that sufficient net positive suction head is available. It is preferred that the 1B and 2B surge tank sections be aligned o the associated operable CCS pump(s); however, aligning a single 1B or 2B surge tank section provides an operable surge tank for the associated pump(s).The pump in each train is automatically started on receipt of a safety injection signal, and all nonessential components will be manually isolated.

Additional information on the design and operation of the system, along with a list of the components served, is presented in the FSAR, Section 9.2.2 (Ref. 1). The principal safety related function of the CCS is the removal of decay heat from the reactor via the Residual Heat Removal (RHR) System. This may be during a normal or post accident cooldown and shutdown.

(continued)

ACTIONS (continued)

intentional or unintentional. The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the use of mitigating actions. The 90 day Completion Time is reasonable based on the determination that the mitigating actions will ensure protection of CRE occupants within analyzed limits while limiting the probability that CRE occupants will have to implement protective measures that may adversely affect their ability to control the reactor and maintain it in a safe shutdown condition in the event of a DBA. In addition, the 90 day Completion Time is a reasonable time to diagnose, plan and possibly repair, and test most problems with the CRE boundary.

C.1 and C.2

In MODE 1, 2, 3, or 4, if the inoperable CREVS train or the CRE boundary cannot be restored to OPERABLE status within the required Completion Time, the plant must be placed in a MODE that minimizes accident risk. To achieve this status, the plant must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

D.1 and D.2

In MODE 5 or 6, or during movement of irradiated fuel assemblies, if the inoperable CREVS train cannot be restored to OPERABLE status within the required Completion Time, action must be taken to immediately place the OPERABLE CREVS train in the emergency mode. This action ensures that the remaining train is OPERABLE, that no failures preventing automatic actuation will occur, and that any active failure would be readily detected.

An alternative to Required Action D.1 is to immediately suspend activities that could result in a release of radioactivity that might require isolation of the CRE. This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel to a safe position.

E.1

If both CREVS trains are inoperable in MODE 1, 2, 3, or 4, due to actions taken as a result of a tornado, the CREVS may not be capable of performing the intended function because of loss of pressurizing air to the control room. At least one train must be restored to OPERABLE status within 8 hours. The 8 hour restoration time is considered reasonable considering the low probability of occurrence of a design basis accident concurrent with a tornado warning.

(continued)

ACTIONS

F.1 and F.2

If one CREVS train cannot be restored to OPERABLE status within the associated Completion Time of Condition E, the plant must be placed in a MODE that minimizes accident risk. To achieve this status, the plant must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

G.1

In MODE 5 or 6, or during movement of irradiated fuel assemblies with two CREVS trains inoperable or with one or more CREVS trains inoperable due to an inoperable CRE boundary, action must be taken immediately to suspend activities that could result in a release of radioactivity that might require isolation of the CRE. This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel to a safe position.

H.1

If both CREVS trains are inoperable in MODE 1, 2, 3, or 4, for reasons other than Condition B or Condition E the CREVS may not be capable of performing the intended function and the plant is in a condition outside the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.7.10.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not too severe, testing each train once every month provides an adequate check of this system. The systems need only be operated for ≥ 15 minutes to demonstrate the function of the system. The 31 day Frequency is based on the reliability of the equipment and the two train redundancy.

SR 3.7.10.2

This SR verifies that the required CREVS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The CREVS filter tests are in accordance with Regulatory Guide 1.52 (Ref. 6). The VFTP includes testing the performance of the HEPA filter, charcoal adsorber efficiency, minimum flow rate, and the physical properties of the activated charcoal. Specific test Frequencies and additional information are discussed in detail in the VFTP.

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B 3.7 PLANT SYSTEMS

B 3.7.16 Component Cooling System (CCS) - Shutdown

BASES

BACKGROUND

The general description of the Component Cooling System (CCS) is provided in TS Bases 3.7.7, "Component Cooling System." The CCS has a Unit 1 Train A header supplied by CCS Pump 1A-A cooled through CCS Heat Exchanger (HX) A. Unit 2 has a separate Train A header containing HX B supplied by CCS Pump 2A-A. The Train B header is shared by Unit 1 and Unit 2 and contains HX C. Flow through the Train B header is normally supplied by CCS Pump C-S. CCS Pump 1B-B can be aligned to supply the Train B header, but it is normally aligned to the Unit 1 Train A header. Similarly, CSS Pump 2B-B can supply cooling water to the Train B header, but is normally aligned to the Unit 2 Train A header. The following describes the functions and requirements within the first 48 hours after shut down, when the Residual Heat Removal (RHR) System is being used for residual and decay heat removal.

During a normal shutdown, decay heat removal is via the reactor coolant system (RCS) loops until sometime after the unit has been cooled down to RHR entry conditions (T_{cold} < 350°F). Therefore, as LCO 3.7.16 becomes Applicable (entry into Mode 4) the RCS loops are still OPERABLE. Entry into MODES 4 and 5 can place high heat loads onto the RHR System, CCS and the Essential Raw Cooling Water System (ERCW) when shutdown cooling is established. Residual and decay heat from the Reactor Coolant System (RCS) is transferred to CCS via the RHR HX. Heat from the CCS is transferred to the ERCW System via the CCS HXs. The CCS and ERCW systems are common between the two operating units.

During the first 48 hours after reactor shutdown, the heat loads are at sufficiently high levels that the normal pump requirement of LCO 3.7.7 for one CCS pump on the Train B header may not be sufficient to support shut down cooling of Unit 1, concurrent with a design basis loss of coolant accident (LOCA) on Unit 2 with loss of offsite power and a single failure of Train A power to 6.9 kV Shutdown Boards 1A-A and 2A-A.

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BACKGROUND (continued)

In this scenario, CCS Pump C-S would normally be the only pump supplying the Train B header. The Train B header would be supplying both the Unit 1 RHR Train B HX and the Unit 2 RHR Train B HX cooling the recirculating Emergency Core Cooling System (ECCS) water from the containment sump.

To assure that there would be adequate CCS flow to both units' RHR Train B HXs, prior to placing RHR in service for Unit 1, either CCS Pump 1B-B or 2B-B would be aligned to the CCS Train B header.

With two CCS pumps on the Train B header, CCS will supply at least 5000 gpm to the Unit 2 RHR Train B HX and 5000 gpm to the Unit 1 RHR Train B HX.

The alignment of either CCS Pump 1B-B or 2B-B to the CCS Train B header before entry into MODE 4 places both units in an alignment that supports LOCA heat removal requirements and allows the other unit to proceed to cold shutdown. Having the CCS pumps realigned while a unit is being shut down with steam generators available for heat removal, precludes the need for manual action outside of the main control room to align CCS should a LOCA occur. If a LOCA occurs with the concurrent loss of the Train A 6.9 kV shutdown boards, CCS Pump 1B-B or 2B-B will be started from the main control room, if the pump is not already in operation. Both CCS pumps must be running before the RHR pump suction is transferred from the refueling water storage tank (RWST) to the containment sump to ensure adequate cooling is maintained. If a LOCA occurs, the C-S pump automatically starts on a safety injection (SI) actuation from either unit. The CCS pump control circuits are designed such that, if a pump is running and a loss of power occurs, the pump will be automatically reloaded on the DG. With this alignment, two CCS pumps will be available if a LOCA occurs on one unit when the other unit is being shut down.

Alternatively, the unit being shut down can remain on steam generator cooling for 48 hours before RHR is placed in service. If a LOCA occurred on the other unit, CCS would only be removing heat from one RHR HX. A single CCS pump and CCS HX provides the required heat removal capability.

After the unit has been shut down for greater than 48 hours, a single CCS pump on Train B provides adequate flow to both the Unit 1 and the Unit 2 RHR Train B HXs.

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BASES

BACKGROUND (continued)

If the single failure were the loss of Train B power, the normal CCS alignment is acceptable, because CCS Pump 1A-A supplies the Unit 1 RHR Train A HX and CCS Pump 2A-A supplies the Unit 2 RHR Train A HX. CCS Pump 1A-A does not provide heat removal for Unit 2.

Additional information on the design and operation of the system, along with a list of the components served, is presented in the FSAR, Section 9.2.2 (Ref. 1). The principal safety related function of the CCS is the removal of heat from the reactor via the RHR System. This may be during a normal or post accident cool down and shut down.

The Unit 1 CCS Train A header is not used or required to support Unit 2 operation.

APPLICABLE SAFETY ANALYSES

The CCS functions to cool the unit from RHR entry conditions (T_{cold} < 350°F), to MODE 5 (T_{cold} < 200°F), during normal operations. The time required to cool from 350°F to 200°F is a function of the number of CCS and RHR trains operating. One CCS train is sufficient to remove heat during subsequent operations with T_{cold} < 200°F. This assumes a maximum ERCW inlet temperature of 85°F occurring simultaneously with the maximum heat loads on the system.

The design basis of the CCS is for one CCS train to remove the post LOCA heat load from the containment sump during the recirculation phase, with a maximum CCS HX outlet temperature of 110°F (Ref. 2). The ECCS LOCA analysis and containment LOCA analysis each model the maximum and minimum performance of the CCS, respectively. The normal maximum HX outlet temperature of the CCS is 95°F, and, during unit cooldown to MODE 5 (T_{cold} < 200°F), a maximum HX outlet temperature of 110°F is assumed. The CCS design based on these values, bounds the post accident conditions such that the sump fluid will not increase in temperature after alignment of the RHR HXs during the recirculation phase following a LOCA, and provides a gradual reduction in the temperature of this fluid as it is supplied to the RCS by the ECCS pumps.

The CCS is designed to perform its function with a single failure of any active component, assuming a loss of offsite power.

CCS - Shutdown satisfies Criterion 4 of 10 CFR 50.36(c)(2)(ii).

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BASES (continued)

LCO

The CCS trains are independent of each other to the degree that each has separate controls and power supplies and the operation of one does not depend on the other. During a unit shut down, one CCS train is required to provide the minimum heat removal capability assumed in the safety analysis for the systems to which it supplies cooling water. To ensure this requirement is met, two trains of CCS must be OPERABLE. At least one CCS train will operate assuming the worst case single active failure occurs coincident with a loss of offsite power.

This LCO provides CCS train OPERABILITY requirements beyond the requirements of LCO 3.7.7 during the first 48 hours after reactor shut down, when the heat loads are at sufficiently high levels that the normal pump requirement of one CCS pump on the Train B header may not be sufficient to support shutdown cooling of Unit 1, concurrent with a LOCA on Unit 2, a loss of offsite power, and single failure of Train A power to 6.9 kV Shutdown Boards 1A-A and 2A-A.

Because CCS Train B supports heat removal from Unit 1 and Unit 2, when Unit 1 has been shutdown ≤ 48 hours and the RHR System is relied on for heat removal, the following is required for CCS OPERABILITY:

a. Train A is OPERABLE when CCS Pump 1A-A is available and aligned to the CCS Train A header.

b. Train B is OPERABLE when two CCS pumps are available and aligned to the CCS Train B header using any combination of CCS Pumps 1B-B, 2B-B, and C-S.

c. The associated piping, valves, HXs, and instrumentation and controls required to perform the safety related function are OPERABLE.

Because Unit 1 is shutdown and on RHR cooling, no automatic actuations are required as a DBA on Unit 1, such as a LOCA, does not have to be mitigated.

APPLICABILITY

Prior to aligning the RHR System for RCS heat removal in MODE 4, an additional CCS pump must be powered from and aligned to the CCS Train B header to ensure adequate heat removal capability.

The Applicability is modified by a Note stating the LCO does not apply after the initial 48 hours after the unit enters MODE 3 from MODE 1 or MODE 2. Following extended operation in MODE 1, the heat loads are at sufficiently high levels that the normal pump requirement of LCO 3.7.7 for

(continued)

APPLICABILITY (continued)

one CCS pump on the Train B header may not be sufficient to support shutdown cooling of Unit 1, concurrent with a design basis LOCA on Unit 2 with loss of offsite power and a single failure of Train A power to 6.9 kV Shutdown Boards 1A-A and 2A-A. However, after the initial 48 hours following shutdown of the unit, the heat removal capability of both units is within the capabilities of the CCS without the need for an additional CCS pump aligned to the CCS Train B header.

ACTIONS

A.1

In MODE 4, if one CCS train is inoperable, and the unit is required to be placed in MODE 5 to comply with Required Actions, action must be taken to place the unit in MODE 5 within 24 hours. When the Required Actions of an LCO direct the unit to be placed in MODE 5, either a loss of safety function has occurred or the Required Action and Completion Time for restoring a safety-related component has not been met. Therefore, it is prudent to place the unit in a condition of lower energy with a lower potential for a postulated event. In this Condition, the remaining OPERABLE CCS train is adequate to perform the heat removal function. The 24 hour Completion Time is consistent with LCO 3.4.6, "RCS Loops - MODE 4," Required Action B.1 for the Condition of one required RHR loop inoperable and no RCS loops OPERABLE.

B.1 and B.2

In MODE 4, if one CCS train is inoperable, and the unit is not required to be placed in MODE 5 to comply with Required Actions, actions are taken to verify LCO 3.4.6 is being met with two OPERABLE RCS loops with one loop in operation, and that the unit remains in MODE 4 (Tavg > 200°F). These actions indicate the preference to maintain the unit in a condition with multiple methods of decay heat removal available, i.e., maintain the unit in MODE 4 with two RCS loops operable in addition to the remaining OPERABLE RHR loop. This action precludes entry into the LCO 3.4.6 Actions, as LCO 3.4.6 is met with two OPERABLE RCS loops and one RCS loop in operation. This Action is conservative to the Required Actions of LCO 3.4.6 when there are two OPERABLE RCS loops.

Maintaining the unit in MODE 4 with additional methods of decay heat removal available minimizes the likelihood of a situation where the decay heat and residual heat of the unit exceeds the capability of the available RHR loop resulting in the possibility of an unintentional MODE change.

(continued)

ACTIONS

B.1 and B.2 (continued)

The Frequency of once per 12 hours ensures that the systems being relied on for heat removal are operating properly and are maintaining the unit in MODE 4. The 12 hour Frequency is reasonable, considering the low probability of a change in system operation during this time period.

If the Required Actions and Completion Times of Condition B are not met, no actions are specified. Therefore, LCO 3.0.3 applies, requiring the unit to be placed in MODE 5 in 37 hours. With one CCS train inoperable and Required Actions require the unit to be placed in MODE 5, Condition A applies, requiring the unit to be placed in MODE 5 in 24 hours. This Action is consistent with the Required Actions of LCO 3.4.6 Condition B (no OPERABLE RCS loops and one inoperable RHR loop).

C.1

In MODE 4, if two CCS trains are inoperable, immediate action must be taken to restore one of the CCS trains to an OPERABLE status, as no CCS train is available to support the heat removal function. Required Action C.1 is consistent with LCO 3.4.6, "RCS Loops - MODE 4," Required Action D.1 for the Condition of required RCS or RHR loops inoperable and no required RCS or RHR loop in operation.

Required Action C.1 is modified by two Notes. Note 1 indicates that all required MODE changes or power reductions are suspended until one CCS train is restored to OPERABLE status. In this case, LCO 3.0.3 is not applicable because it could force the plant into a less safe condition. Note 2 indicates that the applicable Conditions and Required Actions of LCO 3.4.6 be entered for RHR loops made inoperable by the inoperable CCS trains. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

D.1

Required Action D.1 is modified by a Note indicating that the applicable Conditions and Required Actions of LCO 3.4.7, "RCS Loops - MODE 5, Loops Filled," be entered for RHR loops made inoperable by one or more inoperable CCS train(s). This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.
In MODE 5, if one or more CCS train(s) is inoperable, action must be initiated immediately to restore the CCS train(s) to an OPERABLE status to restore heat removal paths. The immediate Completion Time reflects the importance of maintaining the capability of heat removal.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.16.1

Verification that each required CCS pump that is not in operation is OPERABLE ensures that an additional pump can be placed in operation, if needed, to maintain heat removal. Verification is performed by verifying proper breaker alignment and power available to the CCS pump(s). The 12 hour Frequency is based on engineering judgment.

SR 3.7.16.2

This SR verifies that two of the three CCS pumps that are powered from Train B are aligned to the Train B header. Verification of the correct physical alignment assures that adequate CCS flow can be provided to both the Unit 1 and Unit 2 RHR Train B HXs, if required. The 12 hour Frequency is based on engineering judgment, is consistent with procedural controls governing valve alignment, and ensures correct valve positions.

REFERENCES

1. Watts Bar FSAR, Section 9.2.2, “Component Cooling System.”
2. Watts Bar Component Cooling System Description, N3-70-4002.

B 3.7 PLANT SYSTEMS

B 3.7.17 Essential Raw Cooling Water (ERCW) System

BASES

BACKGROUND

The general description of ERCW is provided in TS Bases 3.7.8, "Essential Raw Cooling Water (ERCW) System." The descriptions of Applicable Safety Analyses, LCOs, Applicability, ACTIONS and Surveillance Requirements for applicable MODES are also described in TS Bases 3.7.8. The following discussion applies to the specific Applicability in TS 3.7.17 during the first 48 hours after shut down when the Residual Heat Removal (RHR) System is being used for residual and decay heat removal. The ERCW System provides a heat sink for the removal of process and operating heat from safety related components during a design basis accident (DBA) or transient. During normal operation, and a normal shutdown, the ERCW System also provides this function for various safety related and non-safety related components. The major post-accident heat load on the ERCW System is the Component Cooling System (CCS) heat exchangers (HXs), which are used to cool RHR and the containment spray HXs. The major heat load on the ERCW System when a unit is shut down on RHR is the CCS HX associated with the train(s) of RHR in service.

During a normal shutdown, decay heat removal is via the reactor coolant system (RCS) loops until sometime after the unit has been cooled down to RHR entry conditions (Tcold < 350°F). Therefore, as LCO 3.7.17 becomes Applicable (entry into Mode 4) the RCS loops are still OPERABLE. After the RHR System is aligned as the principle method of decay heat removal, the heat loads on the ERCW System are increased. Normally, two ERCW pumps are sufficient to handle the cooling needs for maintaining one unit in normal operation while mitigating a DBA on the other unit. However, in the unlikely event of a loss of coolant accident (LOCA) on Unit 2 with a concurrent loss of offsite power and a single failure that results in the loss of both Train A or both Train B 6.9 kV shutdown boards while Unit 1 is on RHR shutdown cooling and has been shutdown for less than 48 hours, three ERCW pumps may be required.

This LCO controls the availability of ERCW pumps necessary to support mitigation of a LOCA on Unit 2 when Unit 1 has been shut down for ≤ 48 hours and is utilizing RHR for heat removal.

Additional information about the design and operation of the ERCW System, along with a list of the components served, is presented in the FSAR, Section 9.2.1 (Ref. 1).

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The design basis of the ERCW System is for one ERCW train, in conjunction with the CCS and a 100% capacity Containment Spray System and RHR, to remove core decay heat following a design basis LOCA as discussed in the FSAR, Section 9.2.1 (Ref. 1). This prevents the containment sump fluid from increasing in temperature during the recirculation phase following a LOCA and provides for a gradual reduction in the temperature of this fluid as it is supplied to the Reactor Coolant System (RCS) by the Emergency Core Cooling System (ECCS) pumps. The ERCW System is designed to perform its function with a single failure of any active component, assuming a loss of offsite power.

The ERCW System, in conjunction with the CCS, also cools the unit, as discussed in the FSAR, Section 5.5.7 (Ref. 2) from RHR The ERCW System, in conjunction with the CCS, also cools the unit, as discussed in the FSAR, Section 5.5.7 (Ref. 2) from RHR entry conditions to MODE 5 during normal and post accident operations. The time required to enter MODE 5 is a function of the number of CCS and RHR System trains that are operating. One ERCW train is sufficient to remove heat during subsequent operations in MODES 5 and 6. This assumes a maximum ERCW inlet temperature of 85°F occurring simultaneously with maximum heat loads on the system. In the first 48 hours after the shutdown of Unit 1 assuming a DBA LOCA on Unit 2 with the loss of offsite power and the concurrent loss of two 6.9 kV shutdown boards on the same power train as a single failure. Three ERCW pumps are required to provide the heat removal capacity assumed in the safety analysis for Unit 2 while continuing the cooldown of Unit 1.

ERCW - Shutdown satisfies Criterion 4 of 10 CFR 50.36(c)(2)(ii).

LCO

This LCO provides ERCW train OPERABILITY requirements beyond the requirements of LCO 3.7.8. During the first 48 hours after reactor shutdown, when the heat loads are at sufficiently high levels that the normal pump requirement of two ERCW pumps on one train may not be sufficient to support shutdown cooling of Unit 1, concurrent with a LOCA on Unit 2, an assumed loss of offsite power, and a single failure that affects both 6.9 kV shutdown boards in one power train.

Two ERCW trains are required to be OPERABLE to provide the required redundancy to ensure that the system functions to support a cooldown to MODE 5.

(continued)

LCO (continued)

An ERCW train is considered OPERABLE during the first 48 hours after shutdown when:

a. Two pumps per train, aligned to separate shutdown boards, are OPERABLE; and

b. One additional Train A pump and one additional Train B pump are (continued) capable of being aligned to their respective Unit 1 6.9 kV shutdown board (1A-A and 1B-B) and manually placed in service.

APPLICABILITY

Prior to aligning the RHR System for RCS heat removal in MODE 4, one additional ERCW pump must be capable of being powered by its respective Unit 1 6.9 kV shutdown board (1A-A and 1B-B) and manually placed in service to ensure adequate heat removal capability.

The Applicability is modified by a Note stating the LCO does not apply after the initial 48 hours after the unit enters MODE 3 from MODE 1 or MODE 2. Following extended operation in MODE 1, the heat loads are at sufficiently high levels that the normal pump requirement of LCO 3.7.8 for two ERCW pumps may not be sufficient to support shutdown cooling of Unit 1, concurrent with a design basis LOCA on Unit 2 with loss of offsite power and a single failure of Train A power to 6.9 kV Shutdown Boards 1A-A and 2A-A. However, after the initial 48 hours following unit shutdown, the heat removal capability of both units is within the capabilities of the ERCW System without the need for an additional ERCW pump in each train.

ACTIONS

A.1

In MODE 4, if one ERCW train is inoperable, and the unit is required to be placed in MODE 5 to comply with Required Actions, action must be taken to place the unit in MODE 5 within 24 hours. When the Required Actions of an LCO direct the unit to be placed in MODE 5, either a loss of safety function has occurred or the Required Action and Completion Time for restoring a safety-related component has not been met. Therefore, it is prudent to place the unit in a condition of lower energy with a lower potential for a postulated event. In this Condition, the remaining OPERABLE ERCW train is adequate to perform the heat removal function. The 24 hour Completion Time is consistent with LCO 3.4.6, “RCS Loops - MODE 4,” Required Action B.1 for the Condition of one required RHR loop inoperable and no RCS loops OPERABLE.

(continued)

ACTIONS (continued)

B.1 and B.2

In MODE 4, if one ERCW train is inoperable, and the unit is not required to be placed in MODE 5 to comply with Required Actions, actions are taken to verify LCO 3.4.6 is being met with two OPERABLE RCS loops with one loop in operation, and that the unit remains in MODE 4 (Tavg > 200°F). These actions indicate the preference to maintain the unit in a condition with multiple methods of decay heat removal available, i.e., maintain the unit in MODE 4 with two RCS loops operable in addition to the remaining OPERABLE RHR loop. This action precludes entry into the LCO 3.4.6 Actions, as LCO 3.4.6 is met with two OPERABLE RCS loops and one RCS loop in operation. This Action is conservative to the Required Actions of LCO 3.4.6 when there are two OPERABLE RCS loops.

Maintaining the unit in MODE 4 with additional methods of decay heat removal available minimizes the likelihood of a situation where the decay heat and residual heat of the unit exceeds the capability of the available RHR loop resulting in the possibility of an unintentional MODE change. The Frequency of once per 12 hours ensures that the systems being relied on for heat removal are operating properly and are maintaining the unit in MODE 4. The 12 hour Frequency is reasonable, considering the low probability of a change in system operation during this time period.

If the Required Actions and Completion Times of Condition B are not met, no actions are specified. Therefore, LCO 3.0.3 applies, requiring the unit to be placed in MODE 5 in 37 hours. With one ERCW train inoperable and Required Actions require the unit to be placed in MODE 5, Condition A applies, requiring the unit to be placed in MODE 5 in 24 hours. This Action is consistent with the Required Actions of LCO 3.4.6 Condition B (no OPERABLE RCS loops and one inoperable RHR loop).

Although LCO 3.7.17 provides requirements in addition to those of LCO 3.7.8, the additional requirements of LCO 3.7.17 are not required for DG OPERABILITY. There is sufficient flow to the DGs from ERCW without a third ERCW in each train to support DG OPERABILITY. Although the requirement of LCO 3.7.17 may not be met (i.e., a third pump capable of being aligned to each ERCW Train) the requirement of LCO 3.7.8 is still met. If the requirement of LCO 3.7.8 is not met, the Actions of LCO 3.7.8 include the requirement to enter the Conditions and Required Actions of LCO 3.8.1 for DGs made inoperable by ERCW.

(continued)

ACTIONS (continued)

C.1

In MODE 4, if two ERCW trains are inoperable, immediate action must be taken to restore one of the ERCW trains to an OPERABLE status, as no ERCW train is available to support the heat removal function. Required Action C.1 is consistent with LCO 3.4.6, "RCS Loops - MODE 4," Required Action D.1 for the Condition of required RCS or RHR loops inoperable and no RCS or RHR loop in operation.

Required Action C.1 is modified by two Notes. Note 1 indicates that all required MODE changes or power reductions are suspended until one ERCW train is restored to OPERABLE status. In this case, LCO 3.0.3 is not applicable because it could force the plant into a less safe condition. Note 2 indicates that the applicable Conditions and Required Actions of LCO 3.4.6 be entered for RHR loops made inoperable by the inoperable ERCW trains. This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

D.1

Required Action D.1 is modified by a Note indicating that the applicable Conditions and Required Actions of LCO 3.4.7, "RCS Loops - MODE 5, Loops Filled," be entered for RHR loops made inoperable by one or more inoperable ERCW train(s). This is an exception to LCO 3.0.6 and ensures the proper actions are taken for these components.

In MODE 5, if one or more ERCW train(s) is inoperable, action must be initiated immediately to restore the ERCW train(s) to an OPERABLE status to restore heat removal paths. The immediate Completion Time reflects the importance of maintaining the capability of heat removal.

SURVEILLANCE REQUIREMENTS

SR 3.7.17.1

Verifying the availability of the ERCW pumps provides assurance that adequate ERCW flow is provided for heat removal. Verification that each required ERCW pump that is not in operation is OPERABLE ensures that an additional pump can be placed in operation, if needed, to maintain decay heat removal. Verification is performed by verifying proper breaker alignment and power available to the ERCW pump(s). The ERCW pump Interlock Bypass Switches do not need to be in 'Bypass' in order to meet this SR. The associated ERCW pump Interlock Bypass Switch is positioned by procedure when the third ERCW pump in the respective train is required to be started. The 12 hour Frequency is based on engineering judgment.

(continued)

BASES

REFERENCES

1. Watts Bar FSAR, Section 9.2.1, "Essential Raw Cooling Water."
2. Watts Bar FSAR, Section 5.5.7, "Residual Heat Removal System."

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.1 AC Sources-Operating

BASES

BACKGROUND

The plant AC Electrical Power Distribution System AC sources consist of the offsite power sources (preferred power sources, normal and alternate(s)), and the onsite standby power sources (Train A and Train B diesel generators (DGs)). As required by 10 CFR 50, Appendix A, GDC 17 (Ref. 1), the design of the AC electrical power system provides independence and redundancy to ensure an available source of power to the Engineered Safety Feature (ESF) systems.

The onsite Class 1E AC Distribution System supplies electrical power to four power trains, shared between the two units, with each train powered by an independent Class 1E 6.9 kV shutdown board. Power trains 1A and 2A comprise load group A, and power trains 1B and 2B comprise load Group B. Two DGs associated with one load group can provide all safety related functions to mitigate a loss-of-coolant accident (LOCA) in one unit and safely shutdown the opposite unit. Each 6.9 kV shutdown board has two separate and independent offsite sources of power as well as a dedicated onsite DG source. The A and B train ESF systems each provide for the minimum safety functions necessary to shut down the plant and maintain it in a safe shutdown condition. Power can be supplied to each Class 1E 6.9 kV shutdown board from a normal offsite circuit (either CSST C or D) an alternate offsite circuit (either CSST C or D), a maintenance offsite circuit (either CSST A or B), or a DG.

Offsite power is supplied to the Watts Bar 161 kV transformer yard by two dedicated lines from the Watts Bar Hydro Plant switchyard. This is described in more detail in FSAR Section 8 (Ref.2). From the 161 kV transformer yard, two electrically and physically separated circuits provide AC power, through step-down common station service transformers, to the 6.9 kV shutdown boards. The two offsite AC electrical power sources are designed and located so as to minimize to the extent practical the likelihood of their simultaneous failure under operating and postulated accident and environmental conditions. A detailed description of the offsite power network and the circuits to the Class 1E shutdown boards is found in Reference 2.

An offsite circuit consists of all breakers, transformers, switches, interrupting devices, cabling, and controls required to transmit power from the offsite transmission network (i.e., Watts Bar Hydro Plant switchyard) to the onsite Class 1E ESF buses (i.e., 6.9 kV shutdown boards).

(continued)

BASES

BACKGROUND (continued)

A single offsite circuit is capable of providing the ESF loads. Two of these circuits are required to meet the Limiting Condition for Operation.

The onsite standby power source for each 6.9 kV shutdown board is a dedicated DG. WBN uses 4 DG sets for Unit 1 operation. These same DGs will be shared for Unit 2 operation. A DG starts automatically on a safety injection (SI) signal (i.e., low pressurizer pressure or high containment pressure signals) or on an 6.9 kV shutdown board degraded voltage or loss-of-voltage signal (refer to LCO 3.3.5, "Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation"). After the DG has started, it will automatically tie to its respective 6.9 kV shutdown board after offsite power is tripped as a consequence of 6.9 kV shutdown board loss-of-voltage or degraded voltage, independent of or coincident with an SI signal. The DGs will also start and operate in the standby mode without tying to the 6.9 kV shutdown board on an SI signal alone. Following the trip of offsite power, a loss-of-voltage signal strips all nonpermanent loads from the 6.9 kV shutdown board. When the DG is tied to the 6.9 kV shutdown board, loads are then sequentially connected to its respective 6.9 kV shutdown board by the automatic sequencer. The sequencing logic controls the permissive and starting signals to motor breakers to prevent overloading the DG by automatic load application.

In the event of a loss of preferred power, the 6.9 kV shutdown boards are automatically connected to the DGs in sufficient time to provide for safe reactor shutdown and to mitigate the consequences of a Design Basis Accident (DBA) such as a LOCA.

Certain required plant loads are returned to service in a predetermined sequence in order to prevent overloading the DG in the process. Within the required interval (FSAR Table 8.3-3) after the initiating signal is received, all automatic and permanently connected loads needed to recover the plant or maintain it in a safe condition are returned to service.

Ratings for Train 1A, 1B, 2A and 2B DGs satisfy the requirements of Regulatory Guide 1.9 (Ref. 3). The continuous service rating of each DG is 4400 kW with 10% overload permissible for up to 2 hours in any 24 hour period. The ESF loads that are powered from the 6.9 kV shutdown boards are listed in Reference 2.

(continued)

BASES (continued)

APPLICABLE SAFETY ANALYSES

The initial conditions of DBA and transient analyses in the FSAR, Section 6 (Ref. 4) and Section 15 (Ref. 5), assume ESF systems are OPERABLE. The AC electrical power sources are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System (RCS), and containment design limits are not exceeded. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.4, Reactor Coolant System (RCS); and Section 3.6, Containment Systems.

The OPERABILITY of the AC electrical power sources is consistent with the initial assumptions of the Accident analyses and is based upon meeting the design basis of the plant. This results in maintaining at least two DG's associated with one load group or one offsite circuit OPERABLE during Accident conditions in the event of:

a. An assumed loss of all offsite power or all onsite AC power; and

b. A worst case single failure.

The AC sources satisfy Criterion 3 of NRC Policy Statement.

LCO

Two qualified circuits between the Watts Bar Hydro 161 kV switchyard and the onsite Class 1E Electrical Power System and separate and independent DGs for each train ensure availability of the required power to shut down the reactor and maintain it in a safe shutdown condition after an anticipated operational occurrence (AOO) or a postulated DBA.

Qualified offsite circuits are those that are described in the FSAR and are part of the licensing basis for the plant.

Each offsite circuit must be capable of maintaining acceptable frequency and voltage, and accepting required loads during an accident, while connected to the 6.9 kV shutdown boards.

Offsite power from the Watts Bar Hydro 161 kV switchyard to the onsite Class 1E distribution system is from two independent immediate access circuits. Each of the two required circuits are routed from the switchyard through a 161 kV transmission line and one of four 161 to 6.9 kV transformers (common station service transformers (CSSTs)) to the onsite Class 1E distribution system. Normally the two required circuits are aligned to power the 6.9 kV shutdown boards through CSST C and CSST D. However, one of the two required circuits may also be aligned to power two shutdown boards in the same load group through either CSST A or CSST B and its associated Unit Boards, either directly from the CSST through the Unit Board or by automatic transfer from the Unit Station Service Transformer (USST) to the CSST. Use of CSST A or B as an

(continued)

LCO (continued)

offsite source requires that CSST A and B both be available and that the associated power and control feeders be in their normal positions to ensure independence. Due to independence limitations. CSST A and B cannot be credited for supply of both offsite power sources simultaneously. The medium voltage power system starts at the low-side of the common station service transformers.

Each required offsite circuit is that combination of power sources described below that are either connected to the Class 1E AC Electrical Power Distribution System. or is available to be connected to the Class 1E AC Electrical Power Distribution System through automatic transfer at the 6.9 kV Shutdown or Unit Boards within a few seconds. as required.

The following offsite power configurations meet the requirements of the LCO:

1. Normal Operation (i.e., all 6.9 kV shutdown boards aligned to their normal offsite circuit) - Two offsite circuits consisting of (a) AND (b) (no board transfers required; a loss of either circuit will not prevent the minimum safety functions from being performed);

   a. From the 161 kV Watts Bar Hydro Switchyard (Bay 13), through CSST C (winding Y) to 6.9 kV Shutdown Board 1A-A and (winding X) to 6.9 kV Shutdown Board 2A-A; AND

   b. From the 161 kV Watts Bar Hydro Switchyard (Bay 4), through CSST D (winding X) to 6.9 kV Shutdown Board 1B-B and (winding Y) to 6.9 kV Shutdown Board 2B-B.

2. Alternate Operation (i.e., one or more 6.9 kV shutdown boards aligned to their alternate offsite circuit) – Two offsite circuits consisting of (a) AND (b) AND (c) (as needed) (Note: 6.9 kV shutdown board(s) aligned to normal circuit require an OPERABLE automatic transfer; a loss of either circuit will not prevent the minimum safety functions from being performed);

   a. From the 161 kV Watts Bar Hydro Switchyard (Bay 13), through CSST C (winding Y) to 6.9 kV Shutdown Board 1A-A (normal) AND/OR Shutdown Board 2B-B (alternate) and (winding X) to 6.9 kV Shutdown Board 2A-A (normal) AND/OR Shutdown Board 1B-B (alternate);

   b. From the 161 kV Watts Bar Hydro Switchyard (Bay 4), through CSST D (winding X) to 6.9 kV Shutdown Board 1B-B (normal) AND/OR Shutdown Board 2A-A (alternate) and (winding Y) to 6.9 kV Shutdown Board 2B-B (normal) AND/OR Shutdown Board 1A-A (alternate); AND

   c. An OPERABLE transfer from the normal circuit to the alternate circuit for those 6.9 kV shutdown boards aligned to their normal circuit.

(continued)

BASES (continued)

LCO (continued)

3. Unit Board Operation - Normal Supply (i.e., one offsite circuit includes a unit board supplied by its normal power supply, the USST) - Two offsite circuits consisting of (a) OR (b) (relies on automatic transfer of Unit Board power supply alignment from its normal supply (USST) to its alternate supply (CSST via the Start Bus):

   a. CSST C out-of-service;

      1) From the 161 kV Watts Bar Hydro Switchyard (Bay 4), through CSST D (winding X) to 6.9 kV Shutdown Board 1B-B and (winding Y) to 6.9 kV Shutdown Board 2B-B;

      2) From the 161 kV Watts Bar Hydro Switchyard (Bay 13), through CSST B (winding Y) to the 6.9 kV Unit Board 1B and Unit Board 2B (Breakers 1622 & 1632 open);

      3) From Unit Board 1B to 6.9 kV Shutdown Board 1A-A (Breaker 1718 closed);

      4) From Unit Board 2B to 6.9 kV Shutdown Board 2A-A (Breaker 1818 closed); AND

      5) Unit Board 1B and Unit Board 2B normal to alternate automatic transfer circuit OPERABLE.

   b. CSST D out-of-service;

      1) From the 161 kV Watts Bar Hydro Switchyard (Bay 13), through CSST C (winding X) to 6.9 kV Shutdown Board 1A-A and (winding Y) to 6.9 kV Shutdown Board 2A-A;

      2) From the 161 kV Watts Bar Hydro Switchyard (Bay 4), through CSST A (winding Y) to the 6.9 kV Unit Board 1C and Unit Board 2C (Breakers 1524 and 1534 open);

      3) From Unit Board 1C to 6.9 kV Shutdown Board 1B-B (Breaker 1726 closed);

      4) From Unit Board 2C to 6.9 kV Shutdown Board 2B-B (Breaker 1826 closed); AND

      5) Unit Board 1C and Unit Board 2C normal to alternate automatic transfer circuit OPERABLE.

(continued)

LCO
(continued)

4) Unit Board Operation - Alternate Supply (i.e., one offsite circuit includes a unit board supplied by its alternate power supply, the CSST via the Start Bus) - Two offsite circuits consisting of (a) OR (b) (no board transfers required):

a. CSST C out-of-service;

1) From the 161 kV Watts Bar Hydro Switchyard (Bay 4), through CSST D (winding X) to 6.9 kV Shutdown Board 1B-B and (winding Y) to 6.9 kV Shutdown Board 2B-B; AND

2) From the 161 kV Watts Bar Hydro Switchyard (Bay 13), through CSST B (winding Y) to the 6.9 kV Unit Board 1B and Unit Board 2B (Breakers 1622 and 1632 closed) to 6.9 kV Shutdown Board 1A-A and to 6.9 kV Shutdown Board 2A-A (Breakers 1718 and 1818 closed), respectively.

b. CSST D out-of-service

1) From the 161 kV Watts Bar Hydro Switchyard (Bay 13), through CSST C (winding X) to 6.9 kV Shutdown Board 1A-A and (winding Y) to 6.9 kV Shutdown Board 2A-A; AND

2) From the 161 kV Watts Bar Hydro Switchyard (Bay 4), through CSST A (winding Y) to the 6.9 kV Unit Board 1C and Unit Board 2C (Breakers 1524 and 1534 closed) to 6.9 kV Shutdown Board 1B-B and to 6.9 kV Shutdown Board 2B-B (Breakers 1726 and 1826 closed), respectively.

Although providing a qualified circuit using the 6.9 kV maintenance feed is allowed, limit the time when one of the qualified offsite circuits is aligned to a 6.9 kV shutdown board through the maintenance feed to that needed to complete repairs on CSST C or CSST D

Note: When using either CSST A or B as a qualified offsite circuit, the CSST (A or B) not in use as a qualified circuit must be available.

(continued)

BASES

LCO (continued)

Each DG must be capable of starting, accelerating to rated speed and voltage, and connecting to its respective 6.9 kV shutdown board on detection of loss-of-voltage. This will be accomplished within 10 seconds. Each DG must also be capable of accepting required loads within the assumed loading sequence intervals, and continue to operate until offsite power can be restored to the 6.9 kV shutdown boards. These capabilities are required to be met from a variety of initial conditions such as DG in standby with the engine hot and DG in standby with the engine at ambient conditions. Additional DG capabilities must be demonstrated to meet required Surveillances, e.g., capability of the DG to revert to standby status on an accident signal while operating in parallel test mode.

Proper sequencing of loads, including tripping of nonessential loads, is a required function for DG OPERABILITY.

The AC sources in one train must be separate and independent (to the extent possible) of the AC sources in the other train. For the DGs, separation and independence are complete. However, CSST A or B can only supply two 6.9 kV shutdown boards in the same load group, to ensure the separation criteria is met.

For the offsite AC sources, separation and independence are to the extent practical. A circuit may be connected to more than one ESF bus, with fast transfer capability to the other circuit OPERABLE, and not violate separation criteria. A circuit that is not connected to an ESF bus is required to have OPERABLE fast transfer interlock mechanisms to at least two ESF buses to support OPERABILITY of that circuit.

(continued)

BASES (continued)

APPLICABILITY

The AC sources are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients; and

b. Adequate core cooling is provided and containment OPERABILITY and other vital functions are maintained in the event of a postulated DBA.

The AC power requirements for MODES 5 and 6 are covered in LCO 3.8.2, "AC Sources - Shutdown."

ACTIONS

A Note prohibits the application of LCO 3.0.4.b to an inoperable DG. There is an increased risk associated with entering a MODE or other specified condition in the Applicability with an inoperable DG and the provisions of LCO 3.0.4.b, which allow entry into a MODE or other specified condition in the Applicability with the LCO not met after performance of a risk assessment addressing inoperable systems and components, should not be applied in this circumstance.

A.1

To ensure a highly reliable power source remains with one required offsite circuit inoperable, it is necessary to verify the OPERABILITY of the remaining required offsite circuit on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action not met. However, if a second required circuit fails SR 3.8.1.1, the second offsite circuit is inoperable, and Condition D, for two required offsite circuits inoperable, is entered.

A.2

Required Action A.2, which only applies if the train cannot be powered from a required offsite source, is intended to provide assurance that an event coincident with a single failure of the associated DG will not result in a complete loss of safety function of critical redundant required features. These features are powered from the redundant AC electrical power trains. This includes motor driven auxiliary feedwater pump. Single train systems, such as the turbine driven auxiliary feedwater pump, may not be included.

(continued)

ACTIONS (continued)

A.3

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition A for a period that should not exceed 72 hours. With one required offsite circuit inoperable, the reliability of the offsite system is degraded, and the potential for a loss of offsite power is increased, with attendant potential for a challenge to the plant safety systems. In this Condition, however, the remaining OPERABLE offsite circuit and DGs are adequate to supply electrical power to the onsite Class 1E Distribution System.

The 72 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

The second Completion Time for Required Action A.3 establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition A is entered while, for instance, a DG is inoperable and that DG is subsequently returned OPERABLE, the LCO may already have been not met for up to 72 hours. This could lead to a total of 144 hours, since initial failure to meet the LCO, to restore the offsite circuit. At this time, a DG could again become inoperable, the circuit restored OPERABLE, and an additional 72 hours (for a total of 9 days) allowed prior to complete restoration of the LCO. The 6 day Completion Time provides a limit on the time allowed in a specified condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The "AND" connector between the 72 hour and 6 day Completion Times means that both Completion Times apply simultaneously, and the more restrictive Completion Time must be met.

As in Required Action A.2, the Completion Time allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." This will result in establishing the "time zero" at the time that the LCO was initially not met, instead of at the time Condition A was entered.

(continued)

ACTIONS (continued)

B.1

To ensure a highly reliable power source remains with one or more DGs inoperable in Train A OR with one or more DGs inoperable in Train B, it is necessary to verify the availability of the required offsite circuits on a more frequent basis. Since the Required Action only specifies "perform," a failure of SR 3.8.1.1 acceptance criteria does not result in a Required Action being not met. However, if a circuit fails to pass SR 3.8.1.1, it is inoperable. Upon required offsite circuit inoperability, additional Conditions and Required Actions must then be entered.

B.2

Required Action B.2 is intended to provide assurance that a loss of offsite power, during the period that a DG is inoperable, does not result in a complete loss of safety function of critical systems. These features are designed with redundant safety related trains. This includes motor driven auxiliary feedwater pumps. Single train systems, such as the turbine driven auxiliary feedwater pump, are not included. Redundant required feature failures consist of inoperable features associated with a train, redundant to the train that has inoperable DG(s).

The Completion Time for Required Action B.2 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action, the Completion Time only begins on discovery that both:

a. An inoperable DG exists; and

b. A required feature on the other train (Train A or Train B) is inoperable.

If at any time during the existence of this Condition (one or more DGs inoperable) a required feature subsequently becomes inoperable, this Completion Time would begin to be tracked.

Discovering one or more required DGs in Train A or one or more DGs in Train B inoperable coincident with one or more inoperable required support or supported features, or both, that are associated with the OPERABLE DGs, results in starting the Completion Time for the Required Action. Four hours from the discovery of these events existing concurrently is Acceptable because it minimizes risk while allowing time for restoration before subjecting the plant to transients associated with shutdown.

(continued)

ACTIONS

B.2 (continued)

In this Condition, the remaining OPERABLE DGs and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System. Thus, on a component basis, single failure protection for the required feature's function may have been lost; however, function has not been lost. The 4 hour Completion Time takes into account the OPERABILITY of the redundant counterpart to the inoperable required feature. Additionally, the 4 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

B.3.1 and B.3.2

Required Action B.3.1 provides an allowance to avoid unnecessary testing of OPERABLE DG(s). If it can be determined that the cause of the inoperable DG(s) does not exist on the OPERABLE DG(s), SR 3.8.1.2 does not have to be performed. For the performance of a Surveillance, Required Action B.3.1 is considered satisfied since the cause of the DG(s) being inoperable is apparent. If the cause of inoperability exists on other DG(s), the other DG(s) would be declared inoperable upon discovery and Condition E of LCO 3.8.1 would be entered if the other inoperable DGs are not on the same train. Once the failure is repaired, the common cause failure no longer exists, and Required Actions B.3.1 and B.3.2 are satisfied. If the cause of the initial inoperable DG(s) cannot be confirmed not to exist on the remaining DG(s), performance of SR 3.8.1.2 suffices to provide assurance of continued OPERABILITY of that DG(s).

In the event the inoperable DG(s) is restored to OPERABLE status prior to completing either B.3.1 or B.3.2, the corrective action program will continue to evaluate the common cause possibility. This continued evaluation, however, is no longer under the 24 hour constraint imposed while in Condition B.

According to Generic Letter 84-15 (Ref. 11), 24 hours is reasonable to confirm that the OPERABLE DG(s) is not affected by the same problem as the inoperable DG(s).

(continued)

BASES

ACTIONS (continued)

B.4

According to Regulatory Guide 1.93, (Ref. 6), operation may continue in Condition B for a period that should not exceed 72 hours.

In Condition B, the remaining OPERABLE DGs and offsite circuits are adequate to supply electrical power to the onsite Class 1E Distribution System. The 72 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

The second Completion Time for Required Action B.4 establishes a limit on the maximum time allowed for any combination of required AC power sources to be inoperable during any single contiguous occurrence of failing to meet the LCO. If Condition B is entered while, for instance, an offsite circuit is inoperable and that circuit is subsequently restored OPERABLE, the LCO may already have been not met for up to 72 hours. This could lead to a total of 144 hours, since initial failure to meet the LCO, to restore the DGs. At this time, an offsite circuit could again become inoperable, the DGs restored OPERABLE, and an additional 72 hours (for a total of 9 days) allowed prior to complete restoration of the LCO. The 6 day Completion Time provides a limit on time allowed in a specified condition after discovery of failure to meet the LCO. This limit is considered reasonable for situations in which Conditions A and B are entered concurrently. The "AND" connector between the 72 hour and 6 day Completion Times means that both Completion Times apply simultaneously, and the more restrictive Completion Time must be met.

As in Required Action B.2, the Completion Time allows for an exception to the normal "time zero" for beginning the allowed time "clock." This will result in establishing the "time zero" at the time that the LCO was initially not met, instead of at the time Condition B was entered.

(continued)

BASES

ACTIONS (continued)

C.1 and C.2

Required Action C.1, which applies when two required offsite circuits are inoperable, is intended to provide assurance that an event with a coincident single failure will not result in a complete loss of redundant required safety functions. The Completion Time for this failure of redundant required features is reduced to 12 hours from that allowed for one train without offsite power (Required Action A.2). The rationale for the reduction to 12 hours is that Regulatory Guide 1.93 (Ref. 6) allows a Completion Time of 24 hours for two required offsite circuits inoperable, based upon the assumption that two complete safety trains are OPERABLE. When a concurrent redundant required feature failure exists, this assumption is not the case, and a shorter Completion Time of 12 hours is appropriate. These features are powered from redundant AC safety trains. This includes motor driven auxiliary feedwater pumps. Single train features, such as the turbine driven auxiliary pump, are not included in the list.

The Completion Time for Required Action C.1 is intended to allow the operator time to evaluate and repair any discovered inoperabilities. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." In this Required Action the Completion Time only begins on discovery that both:

a. All required offsite circuits are inoperable; and

b. A required feature is inoperable.

If at any time during the existence of Condition C (two offsite circuits inoperable) a required feature becomes inoperable, this Completion Time begins to be tracked.

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition C for a period that should not exceed 24 hours. This level of degradation means that the offsite electrical power system does not have the capability to effect a safe shutdown and to mitigate the effects of an accident; however, the onsite AC sources have not been degraded. This level of degradation generally corresponds to a total loss of the immediately accessible offsite power sources.

Because of the normally high availability of the offsite sources, this level of degradation may appear to be more severe than other combinations of two AC sources inoperable (e.g., combinations that involve an offsite circuit and one DG inoperable, or one or more DGs in each train inoperable). However, two factors tend to decrease the severity of this level of degradation:

(continued)

ACTIONS

C.1 and C.2 (continued)

a. The configuration of the redundant AC electrical power system that remains available is not susceptible to a single bus or switching failure; and

b. The time required to detect and restore an unavailable required offsite power source is generally much less than that required to detect and restore an unavailable onsite AC source.

With both of the required offsite circuits inoperable, sufficient onsite AC sources are available to maintain the plant in a safe shutdown condition in the event of a DBA or transient. In fact, a simultaneous loss of offsite AC sources, a LOCA, and a worst case single failure were postulated as a part of the design basis in the safety analysis. Thus, the 24 hour Completion Time provides a period of time to effect restoration of one of the offsite circuits commensurate with the importance of maintaining an AC electrical power system capable of meeting its design criteria.

According to Reference 6, with the available offsite AC sources, two less than required by the LCO, operation may continue for 24 hours. If two offsite sources are restored within 24 hours, unrestricted operation may continue. If only one offsite source is restored within 24 hours, power operation continues in accordance with Condition A.

D.1 and D.2

Pursuant to LCO 3.0.6, the Distribution System ACTIONS would not be entered even if all AC sources to it were inoperable, resulting in de-energization. Therefore, the Required Actions of Condition D are modified by a Note to indicate that when Condition D is entered with no AC source to any train, the Conditions and Required Actions for LCO 3.8.9, "Distribution Systems - Operating," must be immediately entered. This allows Condition D to provide requirements for the loss of one offsite circuit and one or more DGs in a train, without regard to whether a train is de-energized. LCO 3.8.9 provides the appropriate restrictions for a de-energized train.

According to Regulatory Guide 1.93 (Ref. 6), operation may continue in Condition D for a period that should not exceed 12 hours.

(continued)

ACTIONS

D.1 and D.2 (continued)

In Condition D, individual redundancy is lost in both the offsite electrical power system and the onsite AC electrical power system. Since power system redundancy is provided by two diverse sources of power, however, the reliability of the power systems in this Condition may appear higher than that in Condition C (loss of both required offsite circuits). This difference in reliability is offset by the susceptibility of this power system configuration to a single bus or switching failure. The 12 hour Completion Time takes into account the capacity and capability of the remaining AC sources, a reasonable time for repairs, and the low probability of a DBA occurring during this period.

E.1

With one or more required DGs in Train A inoperable simultaneous with one or more required DGs in Train B inoperable, there are no remaining standby AC sources. Thus, with an assumed loss of offsite electrical power, insufficient standby AC sources are available to power the minimum required ESF functions. Since the offsite electrical power system is the only source of AC power for this level of degradation, the risk associated with continued operation for a very short time could be less than that associated with an immediate controlled shutdown (the immediate shutdown could cause grid instability, which could result in a total loss of AC power). Since any inadvertent generator trip could also result in a total loss of offsite AC power, however, the time allowed for continued operation is severely restricted. The intent here is to avoid the risk associated with an immediate controlled shutdown and to minimize the risk associated with this level of degradation.

According to Reference 6, with one or more required DGs in Train A inoperable simultaneous with one or more required DGs in Train B inoperable, operation may continue for a period that should not exceed 2 hours.

F.1 and F.2

If the inoperable AC electric power sources cannot be restored to OPERABLE status within the required Completion Time, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

(continued)

BASES

ACTIONS (continued)

G.1 and H.1

Condition G and Condition H corresponds to a level of degradation in which all redundancy in the AC electrical power supplies cannot be guaranteed. At this severely degraded level, any further losses in the AC electrical power system will cause a loss of function. Therefore, no additional time is justified for continued operation. The plant is required by LCO 3.0.3 to commence a controlled shutdown.

SURVEILLANCE REQUIREMENTS

The AC sources are designed to permit inspection and testing of all important areas and features, especially those that have a standby function, in accordance with 10 CFR 50, Appendix A, GDC 18 (Ref. 8). Periodic component tests are supplemented by extensive functional tests during refueling outages (under simulated accident conditions). The SRs for demonstrating the OPERABILITY of the DGs are in accordance with the recommendations of Regulatory Guide 1.9 (Ref. 3) and Regulatory Guide 1.137 (Ref. 9), as addressed in the FSAR.

Where the SRs discussed herein specify voltage and frequency tolerances, the following is applicable. 6800 volts is the minimum steady state output voltage and the 10 second transient value. 6800 volts is 98.6% of the nominal bus voltage of 6900 V corrected for instrument error and is the upper limit of the minimum voltage required for the DG supply breaker to close on the 6.9 kV shutdown board. The specified maximum steady state output voltage of 7260 V is 110% of the nameplate rating of the 6600 V motors. The specified 3 second transient value of 6555 V is 95% of the nominal bus voltage of 6900 V. The specified maximum transient value of 8880 V is the maximum equipment withstand value provided by the DG manufacturer. The specified minimum and maximum frequencies of the DG are 58.8 Hz and 61.2 Hz, respectively. The steady state minimum and maximum frequency values are 59.8 Hz and 60.1 Hz. These values ensure that the safety related plant equipment powered from the DGs is capable of performing its safety functions.

SR 3.8.1.1

This SR ensures proper circuit continuity for the offsite AC electrical power supply to the onsite distribution network and availability of offsite AC electrical power. The breaker alignment verifies that each breaker is in its correct position to ensure that distribution buses and loads are connected to their preferred power source, and that appropriate independence of offsite circuits is maintained. The 7 day Frequency is adequate since breaker position is not likely to change without the operator being aware of it and because its status is displayed in the control room.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.2 and SR 3.8.1.7

These SRs help to ensure the availability of the standby electrical power supply to mitigate DBAs and transients and to maintain the plant in a safe shutdown condition.

For the purposes of SR 3.8.1.2 and SR 3.8.1.7 testing, the DGs are started from standby conditions. The DG engines for WBN have an oil circulation and soakback system that operates continuously to preclude the need for a prelube and warmup when a DG is started from standby. Standby conditions for a DG mean that the diesel engine coolant and oil are being continuously circulated and temperature is being maintained consistent with manufacturer recommendations.

In order to reduce stress and wear on diesel engines, the manufacturer recommends a modified start in which the starting speed of DGs is limited, warmup is limited to this lower speed, and the DGs are gradually accelerated to synchronous speed prior to loading. These start procedures are the intent of Note 2, which is only applicable when such modified start procedures are recommended by the manufacturer.

SR 3.8.1.7 requires that, at a 184 day Frequency, the DG starts from an actual or simulated loss of offsite power signal and achieves required voltage and frequency within 10 seconds. The 10 second start requirement supports the assumptions of the design basis LOCA analysis in the FSAR, Section 15 (Ref. 5). Starting the DG from an emergency start signal ensures the automatic start relays are cycled (deenergized) on a 184 day Frequency.

The 10 second start requirement is not applicable to SR 3.8.1.2 (see Note 2) when a modified start procedure as described above is used. During this testing, the diesel is not in an accident mode and the frequency is controlled by the operator instead of the governor's accident speed reference. If a modified start is not used, the 10 second start requirement of SR 3.8.1.7 applies. Stable operation at the nominal voltage and frequency values is also essential to establishing DG OPERABILITY, but a time constraint is not imposed. This is because a typical DG will experience a period of voltage and frequency oscillations prior to reaching steady state operation if these oscillations are not dampened out by load application. This period may extend beyond the 10 second acceptance criteria and could be a cause for failing the SR. In lieu of a time constraint in the SR, WBN will monitor and trend the actual time to reach steady state operation as a means of ensuring there is no voltage regulator or governor degradation which could cause a DG to become inoperable.

Since SR 3.8.1.7 requires a 10 second start, it is more restrictive than SR 3.8.1.2, and it may be performed in lieu of SR 3.8.1.2. This is the intent of Note 1 of SR 3.8.1.2.

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.7

See SR 3.8.1.2.

SR 3.8.1.8

Transfer of each 6.9 kV shutdown board power supply from the normal offsite circuit to the alternate offsite circuit demonstrates the OPERABILITY of the alternate circuit distribution network to power the shutdown loads. The 18 month Frequency of the Surveillance is based on engineering judgment, taking into consideration the plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

This SR is modified by two Notes. The reason for the first Note is that, during operation with the reactor critical, performance of this SR for the 1A-A or 1B-B Shutdown Board could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, plant safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment. Credit may be taken for unplanned events that satisfy this SR. Examples of unplanned events may include:

1) Unexpected operational events which cause the equipment to perform the function specified by this Surveillance, for which adequate documentation of the required performance is available; and

2) Post corrective maintenance testing that requires performance of this Surveillance in order to restore the component to OPERABLE, provided the maintenance was required, or performed in conjunction with maintenance required to maintain OPERABILITY or reliability.

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.1.8 (continued)

Note 2 specifies that the transfer capability is only required to be met when one or more 6.9 kV shutdown boards require normal and alternate power supplies. When all the 6.9 kV shutdown boards are supplied power by their normal power supply the alternate power supply is not required. When one or more of the 6.9 kV shutdown boards are supplied power from their alternate power supply the automatic transfer for those 6.9 kV shutdown boards required to transfer from their normal to alternate power supply is required to be OPERABLE. If one or more of the 6.9 kV shutdown boards are aligned to its alternate source (CSST C or CSST D) this SR verifies that at least two 6.9 kV shutdown boards in the same load group will be powered from an offsite circuit if a fault occurs on either circuit.

SR 3.8.1.9

Each DG is provided with an engine overspeed trip to prevent damage to the engine. Recovery from the transient caused by the loss of a large load could cause diesel engine overspeed, which, if excessive, might result in a trip of the engine. This Surveillance demonstrates the DG load response characteristics and capability to reject the largest single load without exceeding predetermined voltage and frequency and while maintaining a specified margin to the overspeed trip. The largest single load for each DG is the essential raw cooling water pump at 800 HP. This Surveillance may be accomplished by: 1) tripping the DG output breaker with the DG carrying greater than or equal to its associated single largest post accident load while paralleled to offsite power or while solely supplying the bus, or 2) tripping its associated single largest post accident load with the DG solely supplying the bus. As required by Regulatory Guide 1.9, C1.4 (Ref. 3), the load rejection test is acceptable if the increase in diesel speed does not exceed 75% of the difference between synchronous speed and the overspeed trip setpoint, or 15% above synchronous speed, whichever is lower.

The time and voltage tolerances specified in this SR are derived from Regulatory Guide 1.9 (Ref. 3) recommendations for response during load sequence intervals. The 3 seconds specified is equal to 60% of a typical 5 second load sequence interval associated with sequencing of the largest load. The voltage and maximum transient frequency specified are consistent with the design range of the equipment powered by the DG. SR 3.8.1.9.a corresponds to the maximum frequency excursion, while SR 3.8.1.9.b and SR 3.8.1.9.c are steady state voltage and frequency values to which the system must recover following load rejection. The 18 month Frequency is consistent with the recommendation of Regulatory Guide 1.9 (Ref. 3).

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.1.21 (continued)

The Frequency for accelerated testing is 7 days, but no less than 24 hours. Tests conducted at intervals of less than 24 hours may be credited for compliance with Required Actions. However, for the purpose of re-establishing the normal 31-day Frequency, a successful test at an interval of less than 24 hours should be considered an invalid test and not count towards the 7 consecutive failure free starts, and the consecutive test count is not reset.

A test interval in excess of 7 days (or 31 days as appropriate) constitutes a failure to meet the SRs and results in the associated DG being declared inoperable. It does not, however, constitute a valid test or failure of the DG, and any consecutive test count is not reset.

SR 3.8.1.22

Transfer of the 6.9 kV Unit Boards 1B, 1C, 2B, and 2C power supply from the normal power supply (USST) to the alternate power supply (CSST via the 6.9 kV Start Bus) demonstrates the OPERABILITY of the maintenance offsite circuit to power the shutdown loads when the shutdown board is powered from the USST. The 18-month Frequency of the Surveillance is based on engineering judgment, taking into consideration the plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

This SR is modified by two Notes. The reason for the first Note is that, during operation with the reactor critical, performance of this SR for the 1B or 1C Unit Board could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, plant safety systems. This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment. Credit may be taken for unplanned events that satisfy this SR. Examples of unplanned events may include:

SURVEILLANCE REQUIREMENTS

SR 3.8.1.22 (continued)

1) Unexpected operational events which cause the equipment to perform the function specified by this Surveillance, for which adequate documentation of the required performance is available; and

2) Post corrective maintenance testing that requires performance of this Surveillance in order to restore the component to OPERABLE, provided the maintenance was required, or performed in conjunction with maintenance required to maintain OPERABILITY or reliability.

Note 2 specifies that transfer capability is only required to be met for 6.9 kV Unit Boards that require normal and alternate power supplies. If the unit board is not a part of the required qualified circuit or the qualified circuit is powered from the CSST through the unit board to the 6.9 kV shutdown board, the automatic transfer is not required.

REFERENCES

1. Title 10, Code of Federal Regulations, Part 50, Appendix A, General Design Criterion (GDC) 17, "Electrical Power Systems."

2. Watts Bar FSAR, Section 8.2, "Offsite Power System," and Tables 8.3-1 to 8.3-3, "Safety-Related Standby Power Sources and Distribution Boards," "Shutdown Board Loads Automatically Tripped Following a Loss of Nuclear Unit and Preferred Power," and "Diesel Generator Load Sequentially Applied Following a Loss of Nuclear Unit and Preferred Power."

3. Regulatory Guide 1.9, Rev. 3, "Selection, Design, Qualification and Testing of Emergency Diesel Generator Units Used as Class 1E Onsite Electric Power Systems at Nuclear Power Plants," July 1993.

4. Watts Bar FSAR Section 6, "Engineered Safety Features."

5. Watts Bar FSAR, Section 15.4, "Condition IV-Limiting Faults."

6. Regulatory Guide 1.93, Rev. 0, "Availability of Electric Power Sources," December 1974.

7. Generic Letter 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability," July 2, 1984.

8. Title 10, Code of Federal Regulations, Part 50, Appendix A, GDC 18, "Inspection and Testing of Electric Power Systems."

REFERENCES (continued)

9. Regulatory Guide 1.137, Rev. 1, "Fuel Oil Systems for Standby Diesel Generators," October 1979.

10. Watts Bar Drawing 1-47W605-242, "Electrical Tech Spec Compliance Tables.

11. Generic Letter 84-15, "Proposed Staff Actions to Improve and Maintain Diesel Generator Reliability," dated July 2, 1984.

Table B 3.8.9-1 (page 1 of 1)
AC and DC Electrical Power Distribution Systems

TYPE	VOLTAGE	TRAIN A*	TRAIN B*
AC safety buses	6900 V	Shdn Bd 1A-A, 2A-A	Shdn Bd 1B-B, 2B-B
	480 V	Shdn Bd 1A1-A, 1A2-A 2A1-A, 2A2-A Rx MOV Bd 1A1-A, 1A2-A 2A1-A,** 2A2-A C & A Vent Bd 1A1-A, 1A2-A 2A1-A, 2A2-A Diesel Aux Bd 1A1-A, 1A2-A 2A1-A, 2A2-A Rx Vent Bd 1A-A, 2A-A**	Shdn Bd 1B1-B, 1B2-B 2B1-B, 2B2-B Rx MOV Bd 1B1-B, 1B2-B 2B1-B,** 2B2-B C & A Vent Bd 1B1-B, 1B2-B 2B1-B, 2B2-B Diesel Aux Bd 1B1-B, 1B2-B 2B1-B, 2B2-B Rx Vent Bd 1B-B, 2B-B**
AC vital buses	120 V	Vital channel 1-I Vital channel 2-I Vital channel 1-III Vital channel 2-III	Vital channel 1-II Vital channel 2-II Vital channel 1-IV Vital channel 2-IV
DC buses	125 V	Board I Board III	Board II Board IV

* Each train of the AC and DC electrical power distribution systems is a subsystem.

** For WBN Unit 1, 480V Reactor MOV Boards 2A1-A and 2B1-B and 480V Reactor Vent Boards 2A-A and 2B-B are available for economic and operational convenience. The boards contain no Unit 1 Technical Specification (TS) Required loads. The boards are considered part of the Unit 1 / Unit 2 Electrical Power Distribution System and meet Unit 1 TS Requirements and testing only while connected. WBN Unit 1 is designed to be operated, shutdown, and maintained in a safe shutdown status without any of these boards or their loads. As such, the boards may be disconnected from service without entering a Unit 1 LCO provided their loads are not substituting for a Unit 1 TS Required load.

ENCLOSURE 3
WBN TECHNICAL REQUIREMENTS MANUAL
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TECHNICAL REQUIREMENTS

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BASES

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LIST OF MISCELLANEOUS REPORTS AND PROGRAMS

LIST OF ACRONYMS

Acronym	Title
ABGTS	Auxiliary Building Gas Treatment System
ACRP	Auxiliary Control Room Panel
ASME	American Society of Mechanical Engineers
AFD	Axial Flux Difference
AFW	Auxiliary Feedwater System
ARO	All Rods Out
ARFS	Air Return Fan System
ARV	Atmospheric Relief Valve
BOC	Beginning of Cycle
CCS	Component Cooling Water System
CFR	Code of Federal Regulations
COLR	Core Operating Limits Report
CREVS	Control Room Emergency Ventilation System
CSS	Containment Spray System
CST	Condensate Storage Tank
DNB	Departure from Nucleate Boiling
ECCS	Emergency Core Cooling System
EFPD	Effective Full-Power Days
EGTS	Emergency Gas Treatment System
EOC	End of Cycle
ERCW	Essential Raw Cooling Water
ESF	Engineered Safety Feature
ESFAS	Engineered Safety Features Actuation System
HEPA	High Efficiency Particulate Air
HVAC	Heating, Ventilating, and Air-Conditioning
LCC	Lower Compartment Cooler
LCO	Limiting Condition For Operation
MFIV	Main Feedwater Isolation Valve
MFRV	Main Feedwater Regulation Valve
MSIV	Main Steam Line Isolation Valve
MSSV	Main Steam Safety Valve
MTC	Moderator Temperature Coefficient
NMS	Neutron Monitoring System
ODCM	Offsite Dose Calculation Manual
PCP	Process Control Program
PDMS	Power Distribution Monitoring System
PIV	Pressure Isolation Valve
PORV	Power-Operated Relief Valve
PTLR	Pressure and Temperature Limits Report
QPTR	Quadrant Power Tilt Ratio
RAOC	Relaxed Axial Offset Control
RCCA	Rod Cluster Control Assembly
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RTP	Rated Thermal Power
RTS	Reactor Trip System
RWST	Refueling Water Storage Tank
SG	Steam Generator
SI	Safety Injection
SL	Safety Limit
SR	Surveillance Requirement
UHS	Ultimate Heat Sink

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Revision 1	12-06-95	Submerged Component Circuit Protection
Revision 2	01-04-96	Area Temperature Monitoring - Change in MSSV Limit
Revision 3	02-28-96	Turbine Driven AFW Pump Suction Requirement
Revision 4	08-18-97	Time-frame for Snubber Visual Exams
Revision 5	08-29-97	Performance of Snubber Functional Tests at Power
Revision 6	09-08-97	Revised Actions for Turbine Overspeed Protection
Revision 7	09-12-97	Change OPΔT/OTΔT Response Time
Revision 8	09-22-97	Clarification of Surveillance Frequency for Position Indication System
Revision 9	10-10-97	Revised Boron Concentration for Borated Water Sources
Revision 10	12-17-98	ICS Inlet Door Position Monitoring - Channel Check
Revision 11	01-08-99	Computer-Based Analysis for Loose Parts Monitoring
Revision 12	01-15-99	Removal of Process Control Program from TRM
Revision 13	03-30-99	Deletion of Power Range Neutron Flux High Negative Rate Reactor Trip Function
Revision 14	04-07-99	Submerged Component Circuit Protection
Revision 15	04-07-99	Submerged Component Circuit Protection
Revision 16	04-13-99	Submerged Component Circuit Protection
Revision 17	05-25-99	Flood Protection Plan
Revision 18	08-03-99	Submerged Component Circuit Protection
Revision 19	10-12-99	Upgrade Seismic Monitoring Instruments
Revision 20	03/13/00	Added Notes to Address Instrument Error for Various Parameters
Revision 21	04/13/00	COLR, Cycle 3, Rev 2
Revision 22	07/07/00	Elimination of Response Time Testing

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Revision 23	01/22/01	Plant Calorimetric (LEFM)
Revision 24	03/19/01	TRM Change Control Program per 50.59 Rule
Revision 25	05/15/01	Change in Preventive Maintenance Frequency for Molded Case Circuit Breakers
Revision 26	05/29/01	Change CVI Response Time from 5 to 6 Seconds
Revision 27	01/31/02	Change pH value in the borated water sources due to TS change for ice weight reduction
Revision 28	02/05/02	Refueling machine upgrade under DCN D-50991-A
Revision 29	02/26/02	Added an additional action to TR 3.7.3 to perform an engineering evaluation of inoperable snubber's impact on the operability of a supported system.
Revision 30	06/05/02	Updated TR 3.3.5.1 to reflect implementation of the TIPTOP program in a Technical Instruction (TI).
Revision 31	10/31/02	Correct RTP to 3459 MWt (PER 02-9519-000)
Revision 32	09/17/03	Editorial correction to Bases for TSR 3.1.5.3.
Revision 33	10/14/03	Updated TRs 3.1.5 and 3.1.6 and their respective bases to incorporate boron concentration changes in accordance with change packages WBN-TS-02-14 and WBN-TS-03-017.
Revision 34	05/14/04	Revised Item 5, "Source Range, Neutron Flux" function of Table 3.3.1-1 to provide an acceptable response time of less than or equal 0.5 seconds. (Reference TS Amendment 52.)
Revision 35	04/06/05	Revised Table 3.3.2-1, "Engineered Safety Features Actuation systems Response Times," to revise containment spray response time and to add an asterisk note to notation 13 of the table via Change Package WBN-TS-04-16.
Revision 36	09/25/06	Revised the response time for Containment Spray in Table 3.3.2-1 and the RT_{NDT} values in the Bases for TR 3.7.1. Both changes result from the replacement of the steam generators.
Revision 37	11/08/06	Revised TR 3.1.5 and 3.1.6 and the Bases for these TRs to update the boron concentration limits of the RWST and the BAT.

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Revisions	Issued	SUBJECT
Revision 38	11/29/06	Updated the TRM to be consistent with Tech Spec Amendment 55. TRM Revision 38 modified the requirements for mode change limitations in TR 3.0.4 and TSR 3.0.4 by incorporating changes similar to those outlined in TSTF-359, Revision 9. (TS-06-24)
Revision 39	04/16/07	Updated the TRM to be consistent with Tech Spec Amendment 42. TRM Revision 39 modified the requirements of TSR 3.0.3 by incorporating changes similar to those outlined in TSTF-358. (TS-07-03)
Revision 40	05/24/07	Updated the TRM and Bases to remove the various requirements for the submittal of reports to the NRC. (TS-07-06)
Revision 41	05/25/07	Revision 41 updates the Bases of TR 3.1.3, 3.1.4 and 3.4.5 to be consistent with Technical Specification Amendment 66. This amendment replaces the references to Section XI of the ASME Boiler and Pressure Vessel Code with the ASME Operation and Maintenance Code for Inservice Testing (IST) activities and removes reference to "applicable supports" from the IST program.
Revision 42	03/20/2008	Revision 42 updates Figure 3.1.6 to remove the 240 TPBAR Limit.
Revision 43	07/17/2008	Revision 43 removes a reporting requirement from TR 3.7.4, "Sealed Source Contamination." The revision also updates the Bases for TR 3.7.4.
Revision 44	10/10/2008	Revision 44 updates Table 3.3.1-1 to be consistent with the changes approved by NRC as Tech Spec Amendment 68.
Revision 45	02/23/2009	Added TR 3.3.8, "Hydrogen Monitors," and the Bases for TR 3.3.8. This change is based on Technical Specification (TS) Amendment 72 which removed the Hydrogen Monitors (Function 13 of LCO 3.3.3) from the TS.
Revision 46	09/20/2010	Revision 46 implements changes from License Amendment 82 (Technical Specification (TS) Bases Revsion 104) for the approved BEACON-TSM application of the Power Distribution Monitoring System (PDMS).
Revision 47	10/08/2010	Revision 47 changes are in response to PER 215552 which requested clarification be added to the TRM regarding supported system operability when a snubber is declared inoperable or removed from service.

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Revisions	Issued	SUBJECT
Revision 48	04/12/2011	CANCELLED
Revision 49	05/24/2011	Revision 49 updated Note 14 of Table 3.3.2-1 to clarify that the referenced time is only for 'partial' transfer of the ECCS pumps from the VCT to the RWST.
Revision 50	12/12/2011	Clarifies the acceptability of periodically using a portion of the 25% grace period in TSR 3.0.2 to facilitate 13 week maintenance work schedules.
Revision 51	08/09/2013	Adds a note to TR 3.1.2 and TR 3.1.4 to permit securing one charging pump in order to supporting transition into or from the Applicability of Technical Specification 3.4.12 (PER 593365).
Revision 52	08/30/2013	Clarifies that TR 3.4.5, "Piping System Structural Integrity," applies to all ASME Code Class 1, 2, and 3 piping systems, and is not limited to reactor coolant system piping.
Revision 53	12/12/2013	Technical Specification Amendment 92 added Limiting Condition for Operation (LCO) 3.9.10, "Decay Time," which was redundant to Technical Requirement (TR) 3.9.1, "Decay Time." Revision 53 removes TR 3.9.1 from the Technical Requirements Manual (TRM) and the TRM Bases.
Revision 54	01/23/2014	TRM which updates Technical Requirement (TR) 3.3.9, "Power Distribution Monitoring System," to reflect the Addendum to WCAP 12472-P-A.
Revision 55	01/14/2015	Provided in the attachment is TRM Revision 55 which revises TRM Table 3.8.3-1 pages 3 and 5, Motor-Operated Valves Thermal Overload Devices which are bypassed under accident conditions. This revision results in the valves requiring their Thermal Overload Bypasses to be operable.
Revision 56	04/30/2015	This revision restructures TR 3.6.2 CONDITIONS, REQUIRED ACTIONS, and COMPLETION TIME(s) to address two distinct cases of system inoperability. TRM BASES B 3.6.2 was also revised to coincide with the changes described above and to include additional detail regarding use of indirect means for performing channel checks
Revision 57	05/07/2015	This revision changes the elevation of the Mean Sea Level by submergence during floods vary from 714.5 ft to 739.2 ft in TRM Bases B 3.7.2, Flood Protection Plan.
Revision 58	05/19/2015	This revision is an administrative change in TRM Bases 3.4.5 background information.

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Revisions	Issued	SUBJECT
Revision 59	10/13/2015	This revision adds the Unit 1 and Unit 2 FCV-67-0066 and FCV-67-0067 valves to TRM Table 3.8.3-1.

ENCLOSURE 4
WBN TECHNICAL REQUIREMENTS MANUAL
CHANGED PAGES

TR 3.6 CONTAINMENT SYSTEMS

TR 3.6.2 Inlet Door Position Monitoring System

TR 3.6.2 The Inlet Door Position Monitoring System shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Inlet Door Position Monitoring System inoperable due to inability to complete channel check.	A.1 Confirm the Ice Bed Temperature Monitoring System is OPERABLE with the ice bed temperature ≤ 27°F.	4 hours <u>AND</u> Each 4 hours thereafter.
	<u>AND</u>	
	A.2 Document condition in accordance with the Corrective Action Program and complete analysis to demonstrate the ice condenser inlet doors are shut.	14 days
B. Inlet Door Position Monitoring System inoperable due to reasons other than Condition A.	B.1 Restore the Inlet Door Monitoring System to OPERABLE status.	48 hours
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Enter Technical Specification LCO 3.6.12, Condition D.	IMMEDIATELY

TECHNICAL SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
TSR 3.6.2.1	Perform CHANNEL CHECK.	12 hours
TSR 3.6.2.2	Perform TADOT.	18 months
TSR 3.6.2.3	Verify that the monitoring system correctly indicates the status of each inlet door as the door is opened and reclosed during its testing per Surveillance Requirements.	In accordance with Technical Specification Surveillance Requirements.

Table 3.8.3-1 (Page 3 of 5)

Motor-Operated Valves Thermal Overload Devices Which Are Bypassed Under Accident Conditions

VALVE NO.	FUNCTION
1-FCV-67-123	CS Heat Exchanger Supply
1-FCV-67-125	CS Heat Exchanger Supply
1-FCV-67-124	CS Heat Exchanger Discharge
1-FCV-67-126	CS Heat Exchanger Discharge
1-FCV-67-146	CCS Heat Exchanger Throttling
2-FCV-67-146	CCS Heat Exchanger Throttling
1-FCV-67-83	Containment Isolation Lower
1-FCV-67-88	Containment Isolation Lower
1-FCV-67-87	Containment Isolation Lower
1-FCV-1-51	AFPT Trip and Throttle Valve
1-FCV-67-95	Containment Isolation Lower
1-FCV-67-96	Containment Isolation Lower
1-FCV-67-91	Containment Isolation Lower
1-FCV-67-103	Containment Isolation Lower
1-FCV-67-104	Containment Isolation Lower
1-FCV-67-99	Containment Isolation Lower
1-FCV-67-111	Containment Isolation Lower
1-FCV-67-112	Containment Isolation Lower
1-FCV-67-107	Containment Isolation Lower
1-FCV-67-130	Containment Isolation Upper
1-FCV-67-131	Containment Isolation Upper
1-FCV-67-295	Containment Isolation Upper
1-FCV-67-134	Containment Isolation Upper
1-FCV-67-296	Containment Isolation Upper
1-FCV-67-133	Containment Isolation Upper
1-FCV-67-139	Containment Isolation Upper
1-FCV-67-297	Containment Isolation Upper
1-FCV-67-138	Containment Isolation Upper
1-FCV-67-142	Containment Isolation Upper
1-FCV-67-298	Containment Isolation Upper

(continued)

Table 3.8.3-1 (Page 5 of 5)

Motor-Operated Valves Thermal Overload Devices Which Are Bypassed Under Accident Conditions

VALVE NO.	FUNCTION
1-FCV-67-89	Containment Isolation
1-FCV-67-97	Containment Isolation
1-FCV-67-105	Lower Containment Isolation
1-FCV-67-113	Lower Containment Isolation
1-FCV-67-143	CCS Heat Exchanger Discharge
2-FCV-67-143	CCS Heat Exchanger Discharge
0-FCV-67-144	CCS Heat Exchanger Bypass
0-FCV-67-152	CCS Heat Exchanger Discharge
0-FCV-67-205	Nonessential Equipment Isolation
0-FCV-67-208	Station Service/Control Air Supply
1-FCV-70-183	Sample Ht Ex Header Outlet
1-FCV-70-100	RCP Oil Cooler Supply Containment Isolation
0-FCV-70-197	SFPCS Heat Exchanger Supply Header
1-FCV-70-215	Sample Ht Ex Header Inlet
1-FCV-74-8	RHR Isolation Bypass
1-FCV-74-9	RHR Isolation Bypass
1-FCV-67-0066	EDG Heat Exchanger 1A1 & 1A2 Supply
2-FCV-67-0066	EDG Heat Exchanger 2A1 & 2A2 Supply
1-FCV-67-0067	EDG Heat Exchanger 1B1 & 1B2 Supply
2-FCV-67-0067	EDG Heat Exchanger 2B1 & 2B2 Supply

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.5 Piping System Structural Integrity

BASES

BACKGROUND

Inservice inspection and pressure testing of ASME Code Class 1, 2, and 3 components in all systems are performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code (Ref. 1) and applicable Addenda, as required by 10 CFR 50.55a(g) (Ref. 2). Exception to these requirements apply where relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i) and (a)(3). In general, the surveillance intervals specified in Section XI of the ASME Code apply. However, the Inservice Inspection Program includes a clarification of the frequencies for performing the inservice inspection and testing activities required by Section XI of the ASME Code. This clarification is provided to ensure consistency in surveillance intervals throughout the Technical Specifications. Each reactor coolant pump flywheel is, in addition, inspected as recommended in Regulatory Position C.4.b of Regulatory Guide 1.14, Revision 1, August 1975 (Ref. 3).

APPLICABLE SAFETY ANALYSES

Certain components which are designed and manufactured to the requirements of specific sections of the ASME Boiler and Pressure Vessel Code are part of the primary success path and function to mitigate DBAs and transients. However, the operability of these components is addressed in the relevant specifications that cover individual components. In addition, this particular Requirement covers only structural integrity inspection/testing requirements for these components, which is not a consideration in designing the accident sequences for theoretical hazard evaluation (Ref.4).

TR

TR 3.4.5 requires that the structural integrity of the ASME Code Class 1, 2, and 3 components in all systems be maintained in accordance with TSR 3.4.5.1 and TSR 3.4.5.2. In those areas where conflict may exist between the Technical Specifications and the ASME Boiler and Pressure Vessel Code, the Technical Specifications take precedence.

(continued)

BASES (continued)

TR

The Inlet Door Position Monitoring System provides the only direct means of determining that the inlet doors are shut. Since an open door would allow heat input that could cause sublimation and mass transfer of ice in the ice condenser compartment, the Inlet Door Position Monitoring System must be OPERABLE whenever the ice bed is required to be OPERABLE. This ensures early detection of an inadvertently opened or failed door, allowing prompt action before ice bed degradation can occur.

APPLICABILITY

The Inlet Door Position Monitoring System is required to be OPERABLE in MODES 1, 2, 3 and 4. This corresponds to the Applicability requirements for the ice bed.

ACTIONS

A.1 and A.2

If the Inlet Door Position Monitoring System is inoperable due to the inability to complete a channel check, an alternate OPERABLE monitoring system must be used to ensure that the ice condenser is not degraded. This is done by confirming the Ice Bed Temperature Monitoring System is OPERABLE with the ice bed temperature ≤ 27°F (value does not account for instrument error). This Action must be completed within 4 hours and each 4 hours thereafter. The Frequency of 4 hours is based on the fact that temperature changes cannot occur rapidly in the ice bed because of the large mass of ice involved. Since this is an indirect means of monitoring inlet door position, operation in MODE 1 may continue indefinitely if through analysis it can be demonstrated that the ice condenser doors are shut. The analysis must be completed within 14 days of entering the action. If the ice bed temperature increases to above 27°F, or an analysis demonstrating the ice condenser doors are shut cannot be completed, the ice bed must be declared inoperable in accordance with Technical Specification 3.6.11, "Ice Bed."

B.1

If the Inlet Door Position Monitoring System is inoperable for reasons other than the inability to complete a channel check, the Inlet Door Position Monitoring System must be restored to OPERABLE status within 48 hours. The 48-hour Completion Time is based on the fact that, with the very large mass of ice involved, it would not be possible for the temperature to increase to the melting point and a significant amount of ice to melt in a 48-hour period.

(continued)

BASES (continued)

ACTIONS (continued)

C.1 and C.2

If the Required Action and associated Completion Time of Condition A or B cannot be met, the plant must be placed in a condition where OPERABILITY of the Inlet Door Position Monitoring System is not required. This is accomplished by immediately entering Technical Specification LCO 3.6.12, Condition D, which requires placing the plant in MODE 4 within 6 hours and MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required MODES from full power in an orderly manner and without challenging plant systems.

TECHNICAL SURVEILLANCE REQUIREMENTS

TSR 3.6.2.1

Performance of the CHANNEL CHECK for the Inlet Door Position Monitoring System once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. Performance of the CHANNEL CHECK helps to ensure that the instrumentation continues to operate properly between each TADOT. The dual switch arrangement on each door allows comparison of open and shut indicators for each zone as well as a check with the annunciator window.

When equipment conditions exist that prevent the preferred direct comparison of open and shut indicators for each zone as described above, indirect methods may be employed to verify that the inlet doors are shut. The indirect methods include the performance of a continuity check of the circuit used by the annunciator window, by monitoring ice bed temperature, or by monitoring ice condenser and containment parameters. The annunciator continuity check can confirm if one or more inlet door zone switch contacts are closed which would represent an open inlet door. The Ice Bed Temperature Monitoring System can be used to provide confirmation of inlet door closure by confirming there is uniform equilibrium temperature in the ice bed. Ice condenser and containment parameters such as temperature and humidity can also be used to determine if an ice condenser inlet door is open.

When indirect methods are used to verify ice condenser inlet doors are shut, a technical analysis must be completed and documented in accordance with the corrective action program. In those instances when a technical analysis can not be made within the allowed Completion Time, the Inlet Door Position Monitoring System must be declared Inoperable and Technical Specification LCO 3.6.12, Condition D must be entered immediately.

B 3.7 PLANT SYSTEMS

B 3.7.2 Flood Protection Plan

BASES

BACKGROUND

Nuclear power plants are designed to prevent the loss of capability for cold shutdown and maintenance thereof resulting from the most severe flood conditions that can reasonably be predicted to occur at the site as a result of severe hydrometeorological conditions, seismic activity, or both (Ref. 1). Assurance that safety-related facilities are capable of surviving all possible flood conditions is provided by the flood protection plan.

The elevations of plant features which could be affected by the submergence during floods vary from 714.5 ft Mean Sea Level (MSL) (access to electrical conduits) to 739.2 ft MSL (excluding wave runup). Plant grade is elevation 728 ft MSL which can be exceeded by extreme rainfall floods and closely approached by seismic-caused dam failure floods. A warning plan is needed to assure plant safety from floods.

The warning plan is divided into two stages. This two-stage plan is designed to allow adequate time for preparing the plant for operation in the flood mode and to avoid excessive economic loss in case a potential flood does not fully develop. Stage I warning, which is a minimum of 10 hours, allows preparation steps, causing some damage to be sustained, but will postpone major economic damage. Stage II warning, which is a minimum of 17 hours, is a warning that a forthcoming flood above grade is predicted.

Stage I procedures consist of a controlled reactor shutdown and other easily revokable steps, such as moving flood supplies above the probable maximum flood elevation and making temporary connections and load adjustments on the onsite power supply. After unit shutdown, the Reactor Coolant System will be cooled and the pressure will be reduced to less than 350 psig. Stage II procedures are the least easily revokable and more damaging steps necessary to have the plant in the flood mode when the flood exceeds plant grade. Heat removal from the steam generators will be accomplished by adding river water

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